

July 30, 2010

Chief, Environmental Enforcement Section  
Environment and Natural Resources Division  
U.S. Department of Justice  
Box 7611 Ben Franklin Station  
Washington, DC 20044-7611

Air and Radiation Division  
EPA Region 5  
77 W. Jackson Blvd (AE-17J)  
Chicago, IL 60604  
Attn: Compliance Tracker

Office of Region Counsel  
EPA Region 5  
77 W. Jackson Blvd (C-14J)  
Chicago, IL 60604

RE: DOJ No. 90-5-2-1-09022  
Vertellus Agriculture & Nutrition Specialties LLC  
Indianapolis Indiana  
Compliance Status Report

To Whom It May Concern:

Vertellus Agriculture & Nutrition Specialties LLC (Vertellus) respectfully submits the enclosed Compliance Status Report as required in Section VII. Reporting Requirements of the Consent Decree between the United States of America and Vertellus, Civil Action No. 1:09-cv-1030 SEB-TAB.

If you have any questions, please contact me at 317-248-6511.

Sincerely,

Tamra Kress  
EHS&S Manager

Cc: John Jones, Vertellus  
Anne Frye, Vertellus  
Constantinos Loukeris, EPA  
Deboraha Carlson, EPA  
David Harrison, IDEM (via email)



Vertellus Agriculture & Nutrition Specialties LLC  
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**Vertellus Agriculture & Nutrition  
Specialties LLC  
Indianapolis Indiana**

**Compliance Status Report**

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**1. Purpose**

The Enhanced LDAR Program (ELP) required by the Consent Decree (CD) with the U.S. Environmental Protection Agency (EPA), Civil Action No. 1:09-cv-1030 SEB-TAB as Lodged on August 21, 2009 and Effective December 1, 2009 (CD), requires Vertellus Agriculture & Nutrition Specialties LLC (Vertellus) to submit this Compliance Status Report by July 31<sup>st</sup> of each year until termination of the CD. The following sections of the report are as outlined in paragraph 61.

**2. The Number of Personnel Assigned to LDAR Functions at the Facility and the Percentage of Time Each Person Dedicated to Performing His/Her LDAR Functions**

The following table includes the persons at the facility having a role in the LDAR program as described in the Facility-Wide LDAR Document and the percentage of time dedicated to LDAR Functions for the following time period:

**Effective Date December 1, 2009 through June 30, 2010**

Role	% Time Dedicated to LDAR Functions
Env, Health, Safety, and Security Manager	20%
Environmental Specialist	50%
Environmental Unit Manager	40%
Environmental Unit Operator	75%
Maintenance Manager	20%
Production Assistant	40%
Reliability Engineer	20%
Mechanics	3.5%
EMSI (LDAR Contractor)	696 man-hours

Note that the percentage of time dedicated to LDAR functions is only an estimate since plant personnel are not required to record or assign hours to projects/tasks.

**3. An Identification and Description of any Non-Compliance with the Requirements of Section V (Compliance Requirements)**

The applicable sections of the CD are identified here to ensure complete reporting of any non-compliance.

**A. Applicability of the Enhanced LDAR Program**

The applicable requirements of the ELP and any federal, state, or local LDAR program are identified in the Facility-Wide LDAR document. The facility complies with the most stringent requirements. As a part of the Third-Party Audit, this information was reviewed and it was confirmed that Vertellus is in compliance with the most stringent LDAR requirements.

#### B. Facility-Wide LDAR Document

The Facility-Wide LDAR Document was developed as required within six months of the Date of Lodging and includes all of the information identified in paragraph 14 of the CD. The document is not a required submittal but was sent to EPA in February 2010. The document must be reviewed and updated on an annual basis. Vertellus is in compliance with the requirements of this Subsection.

#### C. Monitoring Frequencies and Equipment

The monitoring frequencies by equipment type are identified in the Facility-Wide LDAR Document. Vertellus is in compliance with all monitoring frequency requirements. Emission Monitoring Service, Inc. (EMSI) initiated the second quarter monitoring in April 2010. All monitoring data is collected using a data logger and is downloaded to the CLEAR LDAR database at least weekly.

#### D. Leak Definitions

The leak definitions by equipment type are identified in the Facility-Wide LDAR Document. The leak definitions as identified in the CD were implemented in the second quarter monitoring completed by EMSI.

#### E. Repairs

As reported in the semi-annual HON, Pharma, and benzene reports included in Appendix A, all repairs were completed within 15 days or the equipment was placed on the Delay of Repair List (DORL). Quasi-Directed Maintenance was completed as required in the CD with two exceptions noted in Section 5.. For repairs/replacements completed per the CD, see Section 5 of this report.

#### F. Delay of Repair (DOR)

Vertellus complies with the DOR requirements for LDAR. There were no areas on non-compliance for the reporting period.

#### G. Equipment Replacement and Improvement Program

Installing New Valves. The MOC program is described in the Facility-Wide LDAR Document under Section 4 (Tracking Program). The MOC program and incorporation of the ELP requirements into the piping specifications within the Engineering Guidelines ensures that new valves installed to each Covered Process Unit and placed in LDAR service are either Certified Low-Leaking Valves or fitted with Certified Low-Leaking Valve Packing.

List of all Valves in the Covered Process Units. The list of Existing Valves was submitted to EPA on May 20, 2010 as required by the CD.

Replacing or Repacking Valves Found Leaking at or above 250 ppm. For details see section 5 of this report.

Replacing or Repacking Valves with a Screening Value between 100 and 250 ppm during the First Maintenance Shutdown. Per the definition of First Maintenance Shutdown, this activity will occur no sooner than February 2011.

Installing New Connectors. The MOC program is described in the Facility-Wide LDAR Document under Section 4 (Tracking Program). The MOC program and incorporation of the ELP requirements into the piping specifications within the Engineering Guidelines ensures that best efforts are used to install new connectors that are least likely to leak to each Covered Process Unit.

Replacing or improving connectors that leak (Screening Value at or above 250 ppm) two or more times in a rolling 24-month period. Per the CD, the leak definitions were applied starting with the second quarter monitoring for 2010 (no later than nine months from Date of Lodging). As such, only one monitoring event has occurred with no connectors meeting this requirement. For the list of connectors that were found leaking during the quarterly monitoring, see Section 5 of this report.

#### H. Management of Change (MOC)

The MOC program is described in the Facility-Wide LDAR Document under Section 4 (Tracking Program). The MOC program and incorporation of the ELP requirements into the piping specification within the Engineering Guidelines ensures that changes within the Covered Units are reviewed for LDAR compliance.

#### I. Training

Completion of training for all employees and contractors responsible for LDAR monitoring, maintenance of equipment, repairs, or any other duties generated by the program must be completed with one year after Date of Lodging (August 2010). Employee training is ongoing and will be completed by August 21, 2010. Annual refresher training will be performed.

#### J. Quality Assurance/Quality Control

Daily certifications by the monitoring technician (EMSI) are completed on each day that monitoring occurs. These records are kept on-site and reviewed as a part of the quarterly audits completed by Vertellus personnel. No areas of non-compliance have been identified.

**K. LDAR Audits and Corrective Action**

The LDAR Audit Commencement Date was February 19, 2010. The Audit Completion Date was June 18, 2010. The Preliminary Corrective Action Plan (CAP) was completed July 18, 2010. No areas of non-compliance were identified during the audit. There were four items of concern noted and actions for those items are identified in the CAP. The schedule in the Preliminary CAP includes completion of the actions by August 31, 2010.

The Final CAP will be submitted to EPA no later than September 16, 2010 as required by the CD.

**L. Certification of Compliance**

Within 180 days after the initial LDAR Audit Completion Date, Vertellus shall submit the Certification of Compliance as required by paragraph 47. This certification will be submitted to EPA no later than December 14, 2010.

**M. Recordkeeping**

Vertellus is in compliance with the recordkeeping requirements of the CD.

**N. Operation and Maintenance of the Plant 41 Incinerator**

See Section 10 of this report.

**4. An Identification of any Problems Encountered in Complying with the Requirements of Section V (Compliance Requirements)**

As identified in the Preliminary CAP, four items of concern were identified and actions created to resolve the problems encountered. The actions are:

- ACTION—Complete investigation of equipment in the area of tanks 240, 241, 250, 251, 252, and 253
- ACTION—Ensure all applicable tags are in-place
- ACTION—Ensure EMSI corrects the OELCD category for monitoring frequency in the database
- ACTION—Ensure data is tracked in a consistent manner in the database and SAP

**5. The Information Required in Paragraph 37-Equipment Replacement/Improvement Report**

Paragraph 37 requires the following information be provided in this report:

- Actions taken to comply with Subsection G, including identifying each piece of equipment that triggered a requirement in Subsection G, the screening value for that

piece of equipment, the type of action taken (replacement, repacking, improvement, elimination), and the date when action was taken. In Appendix B, is a list of all pieces of equipment found leaking and subject to the requirements of Subsection G (commencing no later than nine months after Date of Lodging).

- Identify any required actions that were not taken and explain why. The following exceptions are noted:
  - Valve 03127 found leaking on 5/14/10 was not monitored within 24 hours of a repair attempt. The repair was completed on a Friday and not monitored until the following Monday. This was a communication problem which is being addressed by better program controls.
  - Flange 02612.01 found leaking on 6/9/10 was not monitored within 24 hours of the final repair-replaced gasket.
- Identify the schedule for any known, future replacements, repacking, improvements, or eliminations. The following valves are due to be replaced:
  - 02845 valve on DORL

**6. A Description of the LDAR Trainings that Have Been Done in Accordance with this Consent Decree**

As provided in Section 3 of this report, completion of training for all employees and contractors responsible for LDAR monitoring, maintenance of equipment, repairs, or any other duties generated by the program must be completed with one year after Date of Lodging (August 2010). Employee training is ongoing and will be completed by August 21, 2010. Annual refresher training will be performed.

**7. Any Deviations Identified in the QA/QC performed under Subsection J of Section V (Compliance Requirements)**

As provided in Section 3 of this report, no deviations were identified.

**8. A Summary of LDAR Audit Results including Specifically Identifying all Areas of Non-Compliance**

A copy of the Third-Party Leak Detection and Repair Audit completed by August Mack Environmental, Inc. is provided in Appendix C. There were no findings of non-compliance, only areas of concern noted.

**9. The Status of all Actions Under any CAP that Was Submitted During the Reporting Period**

No CAP was submitted during the reporting period.

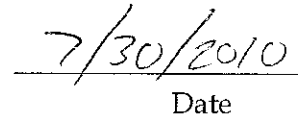
**10. The Documents and Information required under Subsection N of Section V (Compliance Requirements)**

The TO Bypass Incident Reports are included in Appendix D.

**Certification Statement and Signature**

I certify under penalty of law that I have examined and am familiar with the information submitted in this document and all attachments and that this document and its attachments were prepared either by me personally or under my direction or supervision in a manner designed to ensure that qualified and knowledgeable personnel properly gather and present the information contained therein. I further certify, based on my personal knowledge or on my inquiry of those individuals immediately responsible for obtaining the information, that the information is, to the best of my knowledge and belief, true, accurate, and complete.

Site Director  
Bernard Szalkowski

  
Signature  
Date

APPENDIX A

SEMI-ANNUAL HON, PHARMA, BENZENE REPORTS



CERTIFIED MAIL -7010 0290 0002 0422 5329

July 20, 2010

Indiana Department of Environmental Management  
Office of Air Quality  
Compliance and Enforcement Branch  
100 North Senate Avenue  
Mail Code 61-53, IGCN 1003  
Indianapolis, IN 46204-2251

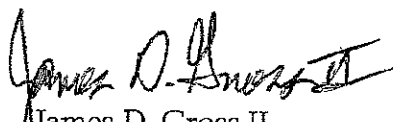
RE: Semi-Annual Equipment Leak Reports  
Title V Permit

To Whom It May Concern:

Vertellus Agriculture & Nutrition Specialties LLC submits these semi-annual equipment leak reports as required under condition D.8.37., D.9.10., and D.11.14. of the modified Title V permit issued April 30, 2009. The attached report is a summary of the information required in permit conditions D.8.37.(a), D.9.10.(a), and D.11.14.(e) for the period from January 1, 2010 through July 31, 2010.

If you have any questions, please contact me at (317)247-8141 ext. 6652.

Sincerely,  
Vertellus Agriculture & Nutrition Specialties LLC

  
James D. Gross II  
Environmental Specialist

Enclosures

Cc:

US EPA, Region 5 (w/encl.)

John Jones - Vertellus Specialties Inc (w/encl.)

Tamra Kress, Ben Stewart, Marty Megregian - Vertellus Agriculture & Nutrition Specialties LLC (w/encl.)



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## SEMIANNUAL EQUIPMENT LEAK REPORT FOR BENZENE

REPORT PERIOD FROM: 01/01/2010 to 06/30/2010

PROCESS UNIT: Plant 40

PERMIT CONDITION: D.9.10.

### PERMIT CONDITION D.9.10.(a)(2)(A) and (B) - VALVES IN BENZENE SERVICE

#### January

- (1) 0 = NUMBER OF VALVES THAT LEAKS WERE DETECTED VIA PERMIT CONDITION D.9.6.(b)
- (2) 0 = NUMBER OF VALVES FOR WHICH LEAKS WERE NOT REPAIRED WITHIN 15 DAYS

#### February

- (1) 0 = NUMBER OF VALVES THAT LEAKS WERE DETECTED VIA PERMIT CONDITION D.9.6.(b)
- (2) 0 = NUMBER OF VALVES FOR WHICH LEAKS WERE NOT REPAIRED WITHIN 15 DAYS

#### March

- (1) 0 = NUMBER OF VALVES THAT LEAKS WERE DETECTED VIA PERMIT CONDITION D.9.6.(b)
- (2) 0 = NUMBER OF VALVES FOR WHICH LEAKS WERE NOT REPAIRED WITHIN 15 DAYS

#### April

- (1) 2 = NUMBER OF VALVES THAT LEAKS WERE DETECTED VIA PERMIT CONDITION D.9.6.(b)
- (2) 0 = NUMBER OF VALVES FOR WHICH LEAKS WERE NOT REPAIRED WITHIN 15 DAYS

#### May

- (1) 0 = NUMBER OF VALVES THAT LEAKS WERE DETECTED VIA PERMIT CONDITION D.9.6.(b)
- (2) 0 = NUMBER OF VALVES FOR WHICH LEAKS WERE NOT REPAIRED WITHIN 15 DAYS

#### June

- (1) 0 = NUMBER OF VALVES THAT LEAKS WERE DETECTED VIA PERMIT CONDITION D.9.6.(b)
- (2) 0 = NUMBER OF VALVES FOR WHICH LEAKS WERE NOT REPAIRED WITHIN 15 DAYS

### PERMIT CONDITION D.9.10.(a)(2)(C) and (D)- PUMPS IN BENZENE SERVICE

#### January

- (1) 0 = NUMBER OF PUMPS THAT LEAKS WERE DETECTED VIA PERMIT CONDITION D.9.4.(b)
- (2) 0 = NUMBER OF PUMPS FOR WHICH LEAKS WERE NOT REPAIRED WITHIN 15 DAYS

#### February

- (1) 0 = NUMBER OF PUMPS THAT LEAKS WERE DETECTED VIA PERMIT CONDITION D.9.4.(b)
- (2) 0 = NUMBER OF PUMPS FOR WHICH LEAKS WERE NOT REPAIRED WITHIN 15 DAYS

#### March

- (1) 1 = NUMBER OF PUMPS THAT LEAKS WERE DETECTED VIA PERMIT CONDITION D.9.4.(b)
- (2) 0 = NUMBER OF PUMPS FOR WHICH LEAKS WERE NOT REPAIRED WITHIN 15 DAYS

#### April

- (1) 0 = NUMBER OF PUMPS THAT LEAKS WERE DETECTED VIA PERMIT CONDITION D.9.4.(b)
- (2) 0 = NUMBER OF PUMPS FOR WHICH LEAKS WERE NOT REPAIRED WITHIN 15 DAYS

#### May

- (1) 0 = NUMBER OF PUMPS THAT LEAKS WERE DETECTED VIA PERMIT CONDITION D.9.4.(b)
- (2) 0 = NUMBER OF PUMPS FOR WHICH LEAKS WERE NOT REPAIRED WITHIN 15 DAYS

#### June

- (1) 0 = NUMBER OF PUMPS THAT LEAKS WERE DETECTED VIA PERMIT CONDITION D.9.4.(b)
- (2) 0 = NUMBER OF PUMPS FOR WHICH LEAKS WERE NOT REPAIRED WITHIN 15 DAYS

### PERMIT CONDITION D.9.10.(a)(2)(E)- DELAY OF REPAIRS

There was no delay of repairs.

## SEMIANNUAL EQUIPMENT LEAK REPORT FOR BENZENE (cont.)

REPORT PERIOD FROM: 01/01/2010 to 06/30/2010

PROCESS UNIT: Plant 40

PERMIT CONDITION: D.9.10.

### PERMIT CONDITION D.9.10.(a)(3)- PROCESS SHUTDOWN DATES

1/1/2010 through 1/4/2010	4/21/2010 through 4/22/2010	6/3/2010
2/15/2010 through 2/18/2010	4/27/2010 through 4/30/2010	6/15/2010
3/1/2010	5/1/2010 through 5/3/2010	6/21/2010
3/3/2010 through 3/8/2010	5/15/2010 through 5/17/2010	

### PERMIT CONDITION D.9.10.(a)(4)- Revisions to items in initial Report

A revised table of equipment subject to monitoring is provided below.

Process Group Identification	Type of Equipment	Number of each Equipment	Method of Compliance
Plant 40	Pumps	3	Monthly leak detection and repair program
Plant 40	Valves	56	Quarterly leak detection and repair program

### PERMIT CONDITION D.9.10.(a)(5)- Results of all Performance Testing

There is no equipment operated under no detectable emissions; therefore results of performance testing or monitoring is not required.

## SEMIANNUAL EQUIPMENT LEAK REPORT FOR HON

REPORT PERIOD FROM: 01/01/2010 to 06/30/2010

PROCESS UNIT: Plant 27

PERMIT CONDITION: D.8.37.

### Permit Condition D.8.37(a)(2)(i) and (ii)– VALVES IN GAS/VAPOR & LL SERVICE

#### 1<sup>st</sup> Quarter 2010

- (1) 0 = THE NUMBER OF LEAKING GAS/VAPOR & LL VALVES DETECTED VIA 63.168(b).
- (2) 0 = THE PERCENT OF LEAKING GAS/VAPOR & LL SERVICE VALVES VIA 63.168(e)(1).
- (3) 0 = THE PERCENT OF LEAKING GAS/VAPOR & LL SERVICE VALVES VIA 63.168(e)(2).
- (4) 0 = THE NUMBER OF GAS/VAPOR & LL VALVES MONITORED.
- (5) 0 = THE NUMBER OF LEAKING GAS/VAPOR & LL VALVES THAT WERE NOT REPAIRED WITHIN 15 DAYS.
- (6) 0 = THE NUMBER OF NONREPAIRABLE GAS/VAPOR & LL SERVICE VALVES INCLUDED IN (1)

#### 2<sup>nd</sup> Quarter 2010

- (1) 10 = THE NUMBER OF LEAKING GAS/VAPOR & LL VALVES DETECTED VIA 63.168(b).
- (2) 0.61% = THE PERCENT OF LEAKING GAS/VAPOR & LL SERVICE VALVES VIA 63.168(e)(1).
- (3) 0.81% = THE PERCENT OF LEAKING GAS/VAPOR & LL SERVICE VALVES VIA 63.168(e)(2).
- (4) 1629 = THE NUMBER OF GAS/VAPOR & LL VALVES MONITORED.
- (5) 2 = THE NUMBER OF LEAKING GAS/VAPOR & LL VALVES THAT WERE NOT REPAIRED WITHIN 15 DAYS.\*
- (6) 0 = THE NUMBER OF NONREPAIRABLE GAS/VAPOR & LL SERVICE VALVES INCLUDED IN (1)

### Permit Condition D.8.37(a)(2)(iii) and (iv)– PUMPS IN LL SERVICE

#### January

- (7) 2 = THE NUMBER OF LEAKING LL PUMPS DETECTED VIA 63.163(b)(1) AND 63.163(b)(2).
- (8) 2 = THE NUMBER OF LEAKING LL PUMPS DETECTED VIA 63.163(b)(3)
- (9) 5.26% = THE PERCENT OF LEAKING LL SERVICE PUMPS AS CALCULATED BY 63.163(d)(4).
- (10) 4.39% = THE PERCENT OF LEAKING LL SERVICE PUMPS AS CALCULATED BY 63.163(d)(2).
- (11) 38 = THE NUMBER OF LL PUMPS MONITORED.
- (12) 0 = THE NUMBER OF LEAKING LL PUMPS THAT WERE NOT REPAIRED WITHIN 15 DAYS.

#### February

- (7) 0 = THE NUMBER OF LEAKING LL PUMPS DETECTED VIA 63.163(b)(1) AND 63.163(b)(2).
- (8) 1 = THE NUMBER OF LEAKING LL PUMPS DETECTED VIA 63.163(b)(3)
- (9) 0.00% = THE PERCENT OF LEAKING LL SERVICE PUMPS AS CALCULATED BY 63.163(d)(4).
- (10) 3.51% = THE PERCENT OF LEAKING LL SERVICE PUMPS AS CALCULATED BY 63.163(d)(2).
- (11) 38 = THE NUMBER OF LL PUMPS MONITORED.
- (12) 0 = THE NUMBER OF LEAKING LL PUMPS THAT WERE NOT REPAIRED WITHIN 15 DAYS.

#### March

- (7) 0 = THE NUMBER OF LEAKING LL PUMPS DETECTED VIA 63.163(b)(1) AND 63.163(b)(2).
- (8) 4 = THE NUMBER OF LEAKING LL PUMPS DETECTED VIA 63.163(b)(3)
- (9) 0.0% = THE PERCENT OF LEAKING LL SERVICE PUMPS AS CALCULATED BY 63.163(d)(4).
- (10) 2.19% = THE PERCENT OF LEAKING LL SERVICE PUMPS AS CALCULATED BY 63.163(d)(2).
- (11) 38 = THE NUMBER OF LL PUMPS MONITORED.
- (12) 1 = THE NUMBER OF LEAKING LL PUMPS THAT WERE NOT REPAIRED WITHIN 15 DAYS.\*

#### April

- (7) 2 = THE NUMBER OF LEAKING LL PUMPS DETECTED VIA 63.163(b)(1) AND 63.163(b)(2).
- (8) 0 = THE NUMBER OF LEAKING LL PUMPS DETECTED VIA 63.163(b)(3)
- (9) 4.88% = THE PERCENT OF LEAKING LL SERVICE PUMPS AS CALCULATED BY 63.163(d)(4).
- (10) 2.13% = THE PERCENT OF LEAKING LL SERVICE PUMPS AS CALCULATED BY 63.163(d)(2).
- (11) 41 = THE NUMBER OF LL PUMPS MONITORED.
- (12) 1 = THE NUMBER OF LEAKING LL PUMPS THAT WERE NOT REPAIRED WITHIN 15 DAYS.\*

#### May

- (7) 3 = THE NUMBER OF LEAKING LL PUMPS DETECTED VIA 63.163(b)(1) AND 63.163(b)(2).
- (8) 1 = THE NUMBER OF LEAKING LL PUMPS DETECTED VIA 63.163(b)(3)
- (9) 7.32% = THE PERCENT OF LEAKING LL SERVICE PUMPS AS CALCULATED BY 63.163(d)(4).
- (10) 2.91% = THE PERCENT OF LEAKING LL SERVICE PUMPS AS CALCULATED BY 63.163(d)(2).
- (11) 41 = THE NUMBER OF LL PUMPS MONITORED.
- (12) 0 = THE NUMBER OF LEAKING LL PUMPS THAT WERE NOT REPAIRED WITHIN 15 DAYS.

\*See delay of repair explanations.

## SEMIANNUAL EQUIPMENT LEAK REPORT FOR HON (Cont.)

REPORT PERIOD FROM: 01/01/2010 to 06/30/2010

PROCESS UNIT: Plant 27

PERMIT CONDITION: D.8.37.

### Permit Condition D.8.37(a)(2)(iii) and (iv) – PUMPS IN LL SERVICE (cont.)

#### June

- (7) 1 = THE NUMBER OF LEAKING LL PUMPS DETECTED VIA 63.163(b)(1) AND 63.163(b)(2).
- (8) 1 = THE NUMBER OF LEAKING LL PUMPS DETECTED VIA 63.163(b)(3)
- (9) 2.44% = THE PERCENT OF LEAKING LL SERVICE PUMPS AS CALCULATED BY 63.163(d)(4).
- (10) 3.32% = THE PERCENT OF LEAKING LL SERVICE PUMPS AS CALCULATED BY 63.163(d)(2).
- (11) 41 = THE NUMBER OF LL PUMPS MONITORED.
- (12) 0 = THE NUMBER OF LEAKING LL PUMPS THAT WERE NOT REPAIRED WITHIN 15 DAYS.

### 40 CFR 63.173– AGITATORS IN LL SERVICE

#### January

- (13) 0 = THE NUMBER OF LEAKING LL AGITATORS DETECTED VIA 63.173(a)
- (14) 0 = THE NUMBER OF LEAKING LL AGITATORS DETECTED VIA 63.167(b)
- (15) 1 = THE NUMBER OF LL AGITATORS MONITORED.
- (16) 0 = THE NUMBER OF LEAKING LL AGITATORS THAT WERE NOT REPAIRED WITHIN 15 DAYS.

#### February

- (13) 0 = THE NUMBER OF LEAKING LL AGITATORS DETECTED VIA 63.173(a)
- (14) 0 = THE NUMBER OF LEAKING LL AGITATORS DETECTED VIA 63.167(b)
- (15) 1 = THE NUMBER OF LL AGITATORS MONITORED.
- (16) 0 = THE NUMBER OF LEAKING LL AGITATORS THAT WERE NOT REPAIRED WITHIN 15 DAYS.

#### March

- (13) 0 = THE NUMBER OF LEAKING LL AGITATORS DETECTED VIA 63.173(a)
- (14) 0 = THE NUMBER OF LEAKING LL AGITATORS DETECTED VIA 63.167(b)
- (15) 1 = THE NUMBER OF LL AGITATORS MONITORED.
- (16) 0 = THE NUMBER OF LEAKING LL AGITATORS THAT WERE NOT REPAIRED WITHIN 15 DAYS.

#### April

- (13) 0 = THE NUMBER OF LEAKING LL AGITATORS DETECTED VIA 63.173(a)
- (14) 0 = THE NUMBER OF LEAKING LL AGITATORS DETECTED VIA 63.167(b)
- (15) 3 = THE NUMBER OF LL AGITATORS MONITORED.
- (16) 0 = THE NUMBER OF LEAKING LL AGITATORS THAT WERE NOT REPAIRED WITHIN 15 DAYS.

#### May

- (13) 0 = THE NUMBER OF LEAKING LL AGITATORS DETECTED VIA 63.173(a)
- (14) 0 = THE NUMBER OF LEAKING LL AGITATORS DETECTED VIA 63.167(b)
- (15) 3 = THE NUMBER OF LL AGITATORS MONITORED.
- (16) 0 = THE NUMBER OF LEAKING LL AGITATORS THAT WERE NOT REPAIRED WITHIN 15 DAYS.

#### June

- (13) 0 = THE NUMBER OF LEAKING LL AGITATORS DETECTED VIA 63.173(a)
- (14) 0 = THE NUMBER OF LEAKING LL AGITATORS DETECTED VIA 63.167(b)
- (15) 3 = THE NUMBER OF LL AGITATORS MONITORED.
- (16) 0 = THE NUMBER OF LEAKING LL AGITATORS THAT WERE NOT REPAIRED WITHIN 15 DAYS

### Permit Condition D.8.37(a)(2)(v) and (vi) – CONNECTORS IN GAS/VAPOR & LL SERVICE

- (17) 4 = THE NUMBER OF LEAKING GAS/VAPOR & LL CONNECTORS DETECTED VIA 63.174(a).
- (18) 0.25% = THE PERCENT OF LEAKING GAS/VAPOR & LL SERVICE CONNECTORS VIA 63.174(i)(2).
- (19) 6891 = THE NUMBER OF GAS/VAPOR & LL CONNECTORS MONITORED.
- (20) 9 = THE NUMBER OF LEAKING GAS/VAPOR & LL CONNECTORS THAT WERE NOT REPAIRED WITHIN 15 DAYS.\*
- (21) 0 = THE NUMBER OF NONREPAIRABLE GAS/VAPOR & LL SERVICE CONNECTORS INCLUDED IN (17).

\*See delay of repair explanations.

## SEMIANNUAL EQUIPMENT LEAK REPORT FOR HON (Cont.)

REPORT PERIOD FROM: 01/01/2010 to 06/30/2010

PROCESS UNIT: Plant 27

PERMIT CONDITION: D.8.37.

### Permit Condition D.8.37(a)(2)(vii) - DELAY OF REPAIRS

There were nine connectors that were put on a delay of repair list because they are part of the process operations and required a shutdown to fix or they were taken out of HAP service. There was one valve that put on a delay of repair list because replacement parts were not available within the 5/15 day repair timeframes. There was one pump that required a process shutdown because the tank had to be emptied so that the shaft on the pump could be realigned by laser sight. There was one pump and one valve not repaired within the 5/15 days, however they were taken out of HAP service and will be repaired prior to putting back in service.

### Permit Condition D.8.37(a)(2)(viii) - MONITORING RESULTS FOR 63.164(i), 63.165(a), and 63.172(f)

40 CFR 63.164(i), 63.165(a), and 63.172(f) are not applicable at this time.

### Permit Condition D.8.37(a)(2)(ix)

Monthly monitoring under D.11.(b)(1)(i) is not required at this time. A quality improvement program under 40 CFR 63.175 or 63.176 is not being initiated at this time.

### Permit Condition D.8.37(a)(2)(x)

Monitoring of connectors that have been opened or had the seal broken will be done in accordance with D.8.16.(c)(1)(ii). This does not apply to connectors that are repaired in accordance with D.8.16.(d).

### Permit Condition D.8.37(a)(3)

A revised table of equipment subject to monitoring and their monitoring frequencies is provided below.

Process Group Identification	Type of Equipment	Number of each Equipment	Method of Compliance
Plant 27	Pumps	41	Monthly leak detection and repair program
Plant 27	Valves	1629	Quarterly leak detection and repair program
Plant 27	Agitators	3	Monthly leak detection and repair program
Plant 27	Connectors	6891	Semi-Annual leak detection and repair program

## SEMIANNUAL EQUIPMENT LEAK REPORT FOR PHARMA MACT

REPORT PERIOD FROM: 01/01/2010 to 06/30/2010

PROCESS UNIT: Plant 41

Permit Condition: D.11.14.(e)

### 63.1255(h)(3)(ii)(A) & (B) – VALVES IN GAS/VAPOR & LL SERVICE

#### 1<sup>st</sup> Quarter 2010

- (1) 0 = THE NUMBER OF LEAKING GAS/VAPOR & LL VALVES DETECTED VIA 63.1255(e)(3).
- (2) 0.0% = THE PERCENT OF LEAKING GAS/VAPOR & LL SERVICE VALVES AS CALCULATED VIA 63.1255(e)(6).
- (3) 0 = THE NUMBER OF GAS/VAPOR & LL VALVES MONITORED.
- (4) 0 = THE NUMBER OF LEAKING GAS/VAPOR & LL VALVES THAT WERE NOT REPAIRED WITHIN 15 DAYS.
- (5) 0 = THE NUMBER OF NONREPAIRABLE GAS/VAPOR & LL SERVICE VALVES INCLUDED IN (1).

#### 2<sup>nd</sup> Quarter 2010

- (1) 1 = THE NUMBER OF LEAKING GAS/VAPOR & LL VALVES DETECTED VIA 63.1255(e)(3).
- (2) 0.13% = THE PERCENT OF LEAKING GAS/VAPOR & LL SERVICE VALVES AS CALCULATED VIA 63.1255(e)(6).
- (3) 383 = THE NUMBER OF GAS/VAPOR & LL VALVES MONITORED.
- (4) 0 = THE NUMBER OF LEAKING GAS/VAPOR & LL VALVES THAT WERE NOT REPAIRED WITHIN 15 DAYS.
- (5) 0 = THE NUMBER OF NONREPAIRABLE GAS/VAPOR & LL SERVICE VALVES INCLUDED IN (1).

### 63.1255(e)(5)(vi)(A)

There were no valve reassignments this reporting period.

### 63.1255(e)(5)(vi)(B)

%V<sub>LO</sub> = 0.13%

### 63.1255(h)(3)(ii)(C) & (D) – PUMPS IN LL SERVICE

#### January

- (6) 0 = THE NUMBER OF LEAKING LL PUMPS DETECTED VIA 63.1255(c)(2)(i) AND (c)(2)(ii)(B).
- (7) 0 = THE NUMBER OF LEAKING LL PUMPS DETECTED VIA 63.1255(c)(2)(iii)
- (8) 0% = THE PERCENT OF LEAKING LL SERVICE PUMPS AS CALCULATED BY 63.1255(c)(4)(iv).
- (9) 6 = THE NUMBER OF LL PUMPS MONITORED.
- (10) 0 = THE NUMBER OF LEAKING LL PUMPS THAT WERE NOT REPAIRED WITHIN 15 DAYS.

#### February

- (6) 1 = THE NUMBER OF LEAKING LL PUMPS DETECTED VIA 63.1255(c)(2)(i) AND (c)(2)(ii)(B).
- (7) 0 = THE NUMBER OF LEAKING LL PUMPS DETECTED VIA 63.1255(c)(2)(iii)
- (8) 16.67% = THE PERCENT OF LEAKING LL SERVICE PUMPS AS CALCULATED BY 63.1255(c)(4)(iv).
- (9) 6 = THE NUMBER OF LL PUMPS MONITORED.
- (10) 0 = THE NUMBER OF LEAKING LL PUMPS THAT WERE NOT REPAIRED WITHIN 15 DAYS.

#### March

- (6) 0 = THE NUMBER OF LEAKING LL PUMPS DETECTED VIA 63.1255(c)(2)(i) AND (c)(2)(ii)(B).
- (7) 0 = THE NUMBER OF LEAKING LL PUMPS DETECTED VIA 63.1255(c)(2)(iii)
- (8) 0% = THE PERCENT OF LEAKING LL SERVICE PUMPS AS CALCULATED BY 63.1255(c)(4)(iv).
- (9) 6 = THE NUMBER OF LL PUMPS MONITORED.
- (10) 0 = THE NUMBER OF LEAKING LL PUMPS THAT WERE NOT REPAIRED WITHIN 15 DAYS.

#### April

- (6) 1 = THE NUMBER OF LEAKING LL PUMPS DETECTED VIA 63.1255(c)(2)(i) AND (c)(2)(ii)(B).
- (7) 1 = THE NUMBER OF LEAKING LL PUMPS DETECTED VIA 63.1255(c)(2)(iii)
- (8) 8.33% = THE PERCENT OF LEAKING LL SERVICE PUMPS AS CALCULATED BY 63.1255(c)(4)(iv).
- (9) 12 = THE NUMBER OF LL PUMPS MONITORED.
- (10) 0 = THE NUMBER OF LEAKING LL PUMPS THAT WERE NOT REPAIRED WITHIN 15 DAYS.

#### May

- (6) 0 = THE NUMBER OF LEAKING LL PUMPS DETECTED VIA 63.1255(c)(2)(i) AND (c)(2)(ii)(B).
- (7) 1 = THE NUMBER OF LEAKING LL PUMPS DETECTED VIA 63.1255(c)(2)(iii)
- (8) 0% = THE PERCENT OF LEAKING LL SERVICE PUMPS AS CALCULATED BY 63.1255(c)(4)(iv).
- (9) 12 = THE NUMBER OF LL PUMPS MONITORED.
- (10) 0 = THE NUMBER OF LEAKING LL PUMPS THAT WERE NOT REPAIRED WITHIN 15 DAYS.

## SEMIANNUAL EQUIPMENT LEAK REPORT FOR PHARMA MACT (CONT.)

REPORT PERIOD FROM: 01/01/2010 to 06/30/2010

PROCESS UNIT: Plant 41

Permit Condition: D.12.15.(e)

### 63.1255(h)(3)(ii)(C) & (D) – PUMPS IN LL SERVICE (cont.)

#### June

- (6) 1 = THE NUMBER OF LEAKING LL PUMPS DETECTED VIA 63.1255(c)(2)(i) AND (c)(2)(ii)(B).
- (7) 1 = THE NUMBER OF LEAKING LL PUMPS DETECTED VIA 63.1255(c)(2)(iii)
- (8) 8.33% = THE PERCENT OF LEAKING LL SERVICE PUMPS AS CALCULATED BY 63.1255(c)(4)(iv).
- (9) 12 = THE NUMBER OF LL PUMPS MONITORED.
- (10) 0 = THE NUMBER OF LEAKING LL PUMPS THAT WERE NOT REPAIRED WITHIN 15 DAYS.

### 63.1255(h)(3)(ii)(C) & (D) – AGITATORS IN LL SERVICE

#### January

- (11) 0 = THE NUMBER OF LEAKING LL AGITATORS DETECTED VIA 63.1255(c)(2)(i) AND (c)(2)(ii)(A).
- (12) 0 = THE NUMBER OF LEAKING LL AGITATORS DETECTED VIA 63.1255(c)(2)(iii).
- (13) 1 = THE NUMBER OF LL AGITATORS MONITORED
- (14) 0 = THE NUMBER OF LEAKING LL AGITATORS THAT WERE NOT REPAIRED WITHIN 15 DAYS.

#### February

- (11) 0 = THE NUMBER OF LEAKING LL AGITATORS DETECTED VIA 63.1255(c)(2)(i) AND (c)(2)(ii)(A).
- (12) 0 = THE NUMBER OF LEAKING LL AGITATORS DETECTED VIA 63.1255(c)(2)(iii).
- (13) 1 = THE NUMBER OF LL AGITATORS MONITORED
- (14) 0 = THE NUMBER OF LEAKING LL AGITATORS THAT WERE NOT REPAIRED WITHIN 15 DAYS.

#### March

- (11) 0 = THE NUMBER OF LEAKING LL AGITATORS DETECTED VIA 63.1255(c)(2)(i) AND (c)(2)(ii)(A).
- (12) 0 = THE NUMBER OF LEAKING LL AGITATORS DETECTED VIA 63.1255(c)(2)(iii).
- (13) 1 = THE NUMBER OF LL AGITATORS MONITORED
- (14) 0 = THE NUMBER OF LEAKING LL AGITATORS THAT WERE NOT REPAIRED WITHIN 15 DAYS.

#### April

- (11) 0 = THE NUMBER OF LEAKING LL AGITATORS DETECTED VIA 63.1255(c)(2)(i) AND (c)(2)(ii)(A).
- (12) 0 = THE NUMBER OF LEAKING LL AGITATORS DETECTED VIA 63.1255(c)(2)(iii).
- (13) 1 = THE NUMBER OF LL AGITATORS MONITORED
- (14) 0 = THE NUMBER OF LEAKING LL AGITATORS THAT WERE NOT REPAIRED WITHIN 15 DAYS.

#### May

- (11) 0 = THE NUMBER OF LEAKING LL AGITATORS DETECTED VIA 63.1255(c)(2)(i) AND (c)(2)(ii)(A).
- (12) 0 = THE NUMBER OF LEAKING LL AGITATORS DETECTED VIA 63.1255(c)(2)(iii).
- (13) 1 = THE NUMBER OF LL AGITATORS MONITORED
- (14) 0 = THE NUMBER OF LEAKING LL AGITATORS THAT WERE NOT REPAIRED WITHIN 15 DAYS.

#### June

- (11) 0 = THE NUMBER OF LEAKING LL AGITATORS DETECTED VIA 63.1255(c)(2)(i) AND (c)(2)(ii)(A).
- (12) 0 = THE NUMBER OF LEAKING LL AGITATORS DETECTED VIA 63.1255(c)(2)(iii).
- (13) 1 = THE NUMBER OF LL AGITATORS MONITORED
- (14) 0 = THE NUMBER OF LEAKING LL AGITATORS THAT WERE NOT REPAIRED WITHIN 15 DAYS.

### 63.1255(h)(3)(ii)(E) & (F) – COMPRESSORS

There are no compressors in HAP service. Therefore this section is not applicable.

### 63.1255(h)(3)(ii)(G) & (H) – CONNECTORS IN GAS/VAPOR & LL SERVICE

- (15) 4 = THE NUMBER OF LEAKING GAS/VAPOR & LL CONNECTORS DETECTED VIA 63.174(a)(1) and (2).
- (16) 0.21% = THE PERCENT OF LEAKING GAS/VAPOR & LL SERVICE CONNECTORS AS CALCULATED BY 63.174(i).
- (17) 1902 = THE NUMBER OF GAS/VAPOR & LL CONNECTORS MONITORED.
- (18) 0 = THE NUMBER OF LEAKING GAS/VAPOR & LL CONNECTORS THAT WERE NOT REPAIRED WITHIN 15 DAYS.
- (19) 0 = THE NUMBER OF NONREPAIRABLE GAS/VAPOR & LL SERVICE CONNECTORS INCLUDED IN (15).

### 63.1255(h)(3)(ii)(I) – DELAY OF REPAIRS

There was no delay of repairs.

## SEMIANNUAL EQUIPMENT LEAK REPORT FOR PHARMA MACT (CONT.)

REPORT PERIOD FROM: 01/01/2010 to 06/30/2010

PROCESS UNIT: Plant 41

Permit Condition: D.12.15.(e)

**63.1255(h)(3)(ii)(J) – MONITORING RESULTS FOR 63.164(i), 63.165(a), and 63.172(f)**

40 CFR 63.164(i), 63.165(a), and 63.172(f) are not applicable at this time.

**63.1255(h)(3)(ii)(K) – INITIATION OF A MONTHLY MONITORING PROGRAM UNDER 63.1255(c)(4)(ii) or 63.1255(e)(4)(i)**

A monthly monitoring program under 63.1255(c)(4)(ii) or 63.1255(e)(4)(i) is not required at this time.

**63.1255(h)(3)(ii)(L) – CHANGE IN CONNECTOR MONITORING PER 63.174(c)**

Monitoring of connectors that have been opened or had the seal broken will be done in accordance with 63.174.(c)(1)(ii). This does not apply to connectors that are repaired in accordance with D.11.4.

**63.1255(h)(3)(iii)**

This requirement is not applicable at this time, since Vertellus does not operate any batch processes.

**63.1255(h)(3)(iv)**

A revised table of equipment subject to monitoring and their monitoring frequencies is provided below.

Process Group Identification	Type of Equipment	Number of each Equipment	Method of Compliance
Plant 41	Pumps	12	Monthly leak detection and repair program
Plant 41	Valves	383	Quarterly leak detection and repair program
Plant 41	Agitators	1	Monthly leak detection and repair program
Plant 41	Connectors	1902	Semi-Annual leak detection and repair program

**INDIANA DEPARTMENT OF ENVIRONMENTAL  
MANAGEMENT  
OFFICE OF AIR QUALITY  
AND  
City of Indianapolis  
Office of Environmental Services**

**PART 70 OPERATING PERMIT  
CERTIFICATION**

Source Name: Vertellus Agriculture & Nutrition Specialties LLC  
Source Address: 1500 South Tibbs Avenue, Indianapolis, Indiana 46242  
Mailing Address: 1500 South Tibbs Avenue, Indianapolis, Indiana 46242  
Part 70 Permit No.: T097-7552-00315

**This certification shall be included when submitting monitoring, testing reports/results  
or other documents as required by this permit.**

Please check what document is being certified:

Annual Compliance Certification Letter \_\_\_\_\_

Test Result (specify) \_\_\_\_\_

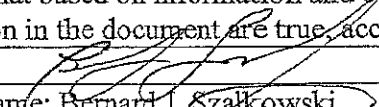
X Report (specify) 1<sup>st</sup> Semi-Annual Equipment Leak Report

Notification (specify) \_\_\_\_\_

Affidavit (specify) \_\_\_\_\_

Other (specify) \_\_\_\_\_

I certify, that based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

Signature: 

Printed Name: Bernard J. Szalkowski

Title/Position: Site Manager

Phone: 317-247-8141 ext. 6401

Date: July 20, 2010

APPENDIX B

REPORT OF EQUIPMENT LEAKS SUBJECT TO SUBPART G

Area	Tag #	Equip.	Part Leaking	Monitor Date	Monitor Reading	VSBL Leaks	Repair Attempt Date	Remonitor Date	Repair Reading	Repair Method	Status	Status Date	Comment
27-PYRID	03002.04	TT 623 160	UNION	05/12/10	1835		05/14/10	05/14/10	660	TIGHTEN UNION	OPN	05/14/10	
27-PYRID	03002.04	TT 623 160	UNION	05/12/10	1835		05/21/10	05/21/10	10	TIGHTEN UNION	RPD	05/21/10	
27-PYRID	03027.05	MS 621 140	SCREWED CONNECTOR	05/12/10	3671		05/14/10	05/14/10	4376	TIGHTEN SCREWED CONNECTOR	OPN	05/14/10	
27-PYRID	03027.05	MS 621 140	SCREWED CONNECTOR	05/12/10	3671		05/19/10	05/19/10	4	REPLACE UNION	RPD	05/19/10	
27-PYRID	03028.02	MS 621 140	UNION	05/12/10	6349		05/14/10	05/14/10	2811	TIGHTEN UNION	OPN	05/14/10	
27-PYRID	03028.02	MS 621 140	UNION	05/12/10	6349		05/19/10	05/19/10	4	REPLACE UNION	RPD	05/19/10	
27-PYRID	03042.03	TT 622 110	TUBING CONNECTOR	05/14/10	5061		05/19/10	05/19/10	14100	TIGHTEN CONNECTOR	OPN	05/19/10	
27-PYRID	03042.03	TT 622 110	TUBING CONNECTOR	05/14/10	5061		05/27/10	05/27/10	24800	TIGHTEN CONNECTOR	OPN	05/27/10	
27-PYRID	03042.03	TT 622 110	TUBING CONNECTOR	05/14/10	5061		DOR 5/27/10	05/27/10	20000	SEAL JOB	S/D	05/28/10	
27-PYRID	03042.03	TT 622 110	TUBING CONNECTOR	05/14/10	5061		07/09/10	07/09/10	0	REPLACE CONNECTOR	RPD	07/09/10	
27-PYRID	03050.01	TT 622 110	SCREWED CONNECTOR	05/12/10	2550		05/14/10	05/14/10	2070	TIGHTEN SCREWED CONNECTOR	OPN	05/14/10	
27-PYRID	03050.01	TT 622 110	SCREWED CONNECTOR	05/12/10	2550		05/21/10	05/21/10	18	REPLACE COMPONENT	RPD	05/21/10	
27-PYRID	03068.01	MS 622 106	FLANGE	05/12/10	2911		05/14/10	05/14/10	18	TIGHTEN BOLTS	RPD	05/14/10	
27-PYRID	03079	MT 250	HATCH	05/13/10	2321		05/13/10	05/13/10	710	TIGHTEN HATCH	OPN	05/13/10	
27-PYRID	03079	MT 250	HATCH	05/13/10	2321		05/18/10	05/18/10	10	REPLACE GASKET	RPD	05/18/10	
27-PYRID	03087	MT 252	HATCH	05/13/10	12900		05/13/10	05/13/10	11000	TIGHTEN HATCH	OPN	05/13/10	
27-PYRID	03087	MT 252	HATCH	05/13/10	12900		05/18/10	05/18/10	38	REPLACE GASKET	RPD	05/18/10	
27-PYRID	03127	AS 622.103	VALVE PACKING	05/14/10	10700		05/19/10	05/19/10	32767	TIGHTEN PACKING	OPN	05/19/10	
27-PYRID	03127	AS 622.103	VALVE PACKING	05/14/10	10700		05/21/10	05/24/10	13700	REPLACE/ADD PACKING	OPN	05/24/10	remonitor not within 24 hrs
27-PYRID	03127	AS 622.103	VALVE PACKING	05/14/10	10700		05/26/10	05/26/10	82	TIGHTEN PACKING	RPD	05/26/10	
27-PYRID	03234.05	AS 621 027	UNION	05/18/10	875		05/21/10	05/21/10	1309	TIGHTEN UNION	OPN	05/21/10	
27-PYRID	03234.05	AS 621 027	UNION	05/18/10	875		05/27/10	05/27/10	981	TIGHTEN UNION	OPN	05/27/10	
27-PYRID	03234.05	AS 621 027	UNION	05/18/10	875		DOR 5/27/10	05/27/10	2213	TIGHTEN UNION	S/D	06/02/10	
27-PYRID	03234.05	AS 621 027	UNION	05/18/10	875		07/09/10	07/16/10	7	ENVIRONMENTALLY REMOVED HYDRO SERVI	RPD	07/16/10	repair during shutdown with remonitor on start-up
27-PYRID	03241.01	AS 621 027	FLANGE	05/18/10	486		05/21/10	05/21/10	25	TIGHTEN FLANGE	RPD	05/21/10	

Area	Tag #	Equip.	Part Leaking	Monitor Date	Monitor Reading	VSBL Leaks	Repair Attempt Date	Remonitor Date	Repair Reading	Repair Method	Status	Status Date	Comment
27-PYRID	03272.01	TT 610 007G	GAUGE	05/18/10	736		05/21/10	05/21/10	3	TIGHTEN GAUGE	RPD	05/21/10	
27-PYRID	03316	TT 610 007C	BONNET	05/18/10	484		05/19/10	05/19/10	484	WORK ORDER	OPN	05/19/10	
27-PYRID	03316	TT 610 007C	BONNET	05/18/10	484		06/01/10	06/01/10	4	REPLACE VALVE	RPD	06/01/10	
27-PYRID	03340	TT 621 008A	VALVE PACKING	05/18/10	1464		05/20/10	05/20/10	1464	WORK ORDER	OPN	05/20/10	
27-PYRID	03340	TT 621 008A	VALVE PACKING	05/18/10	1464		05/24/10	05/24/10	4	TIGHTEN PACKING	RPD	05/24/10	
27-PYRID	03515.10	TT 610 007C	SCREWED CONNECTOR	05/22/10	810		05/26/10	05/26/10	8	TIGHTEN CONNECTOR	RPD	05/26/10	
27-PYRID	03530.01	MR 621 012	PLUG	05/19/10	2482		05/21/10	05/21/10	2021	TIGHTEN PLUG	OPN	05/21/10	
27-PYRID	03530.01	MR 621 012	PLUG	05/19/10	2482		07/07/10	07/16/10	7	REPLACE VALVE	RPD	07/16/10	repair during shutdown with remonitor on start-up
27-PYRID	03530.10	MR 621 012	PLUG	05/19/10	1285		05/21/10	05/21/10	1050	TIGHTEN PLUG	OPN	05/21/10	
27-PYRID	03530.10	MR 621 012	PLUG	05/19/10	1285		07/07/10	07/16/10	7	REPLACE VALVE	RPD	07/16/10	repair during shutdown with remonitor on start-up
27-PYRID	02020	PP-035	PUMP SEAL	04/19/10	4486		04/19/10	04/19/10	3950	WORK ORDER	OPN	04/19/10	
27-PYRID	02020	PP-035	PUMP SEAL	04/19/10	4486		05/03/10	05/03/10	2223	ADJUST SEAL	OPN	05/03/10	
27-PYRID	02020	PP-035	PUMP SEAL	04/19/10	4486		05/04/10	05/04/10	128	ADJUST SEAL	RPD	05/04/10	
27-PYRID	02020	PP-035	PUMP SEAL	05/17/10		VSBL	05/22/10	05/22/10	136	ADJUST SEAL	RPD	05/22/10	
27-PYRID	02020	PP-035	PUMP SEAL	06/23/10	2900		06/28/10	06/28/10	7	ENVIRONMENTALLY REMOVED HYDRO SERVI	OPN	06/28/10	
27-PYRID	02020	PP-035	PUMP SEAL	06/23/10	2900		06/28/10	06/28/10	7	REPLACE VALVE STEM	OPN	06/28/10	
27-PYRID	02020	PP-035	PUMP SEAL	06/23/10	2900		06/29/10	06/29/10	4	OTHER (SPECIFY IN COMMENTS)	RPD	06/29/10	
27-PYRID	02046	TK-263	VALVE PACKING	05/19/10	887		05/21/10	05/21/10	1253	TIGHTEN PACKING	OPN	05/21/10	
27-PYRID	02046	TK-263	VALVE PACKING	05/19/10	887		05/24/10	05/24/10	64	TIGHTEN PACKING	RPD	05/24/10	
27-PYRID	02053	TK-263	VALVE PACKING	05/19/10	3126		05/21/10	05/21/10	7	TIGHTEN PACKING	RPD	05/21/10	
27-PYRID	02104.01	PP-770	FLANGE	05/20/10	981		05/25/10	05/25/10	49	TIGHTEN FLANGE	RPD	05/25/10	
27-PYRID	02107	PP-770	PUMP SEAL	05/11/10	2945		05/13/10	05/14/10	47	ADJUST SEAL	RPD	05/14/10	
27-PYRID	02108.02	TK-263	FLANGE	05/20/10	656		05/25/10	05/25/10	51	TIGHTEN FLANGE	RPD	05/25/10	
27-PYRID	02110.05	TK-262	FLANGE	05/20/10	1114		05/25/10	05/25/10	729	TIGHTEN FLANGE	OPN	05/25/10	
27-PYRID	02110.05	TK-262	FLANGE	05/20/10	1114		07/08/10	07/16/10	4	REPLACE FLANGE	RPD	07/16/10	repair during shutdown with remonitor on start-up

Area	Tag #	Equip.	Part Leaking	Monitor Date	Monitor Reading	VSBL Leaks	Repair Attempt Date	Remonitor Date	Repair Reading	Repair Method	Status	Status Date	Comment
27-PYRID	02112.01	TK-262	PLUG	05/20/10	368		05/25/10	05/25/10	4	TIGHTEN PLUG	RPD	05/25/10	
27-PYRID	02132	TK-262	FLANGE	05/20/10	800		05/25/10	05/25/10	90	TIGHTEN FLANGE	RPD	05/25/10	
27-PYRID	02138	TK-262	VENT	05/20/10	13000		05/23/10	05/24/10	13000	OTHER (SPECIFY IN COMMENTS)	OPN	05/24/10	
27-PYRID	02138	TK-262	VENT	05/20/10	13000		OHS 5/25/10	05/26/10	5	ENVIRONMENTALLY REMOVED HYDRO SERVI	OHS	06/04/10	
27-PYRID	02156	PP-032	SIGHTGLASS	05/23/10	603		05/27/10	05/27/10	819	SEAL JOB	OPN	05/27/10	
27-PYRID	02156	PP-032	SIGHTGLASS	05/23/10	603		06/03/10	06/03/10	4	REPLACE SIGHT GLASS	RPD	06/03/10	
27-PYRID	02218.01	PP001A/B	FLANGE	05/23/10	679		05/27/10	05/27/10	6	OTHER (SPECIFY IN COMMENTS)	RPD	05/27/10	
27-PYRID	02218.02	PP001A/B	FLANGE	05/23/10	620		05/27/10	05/27/10	6	REPLACE GASKET	RPD	05/27/10	
27-PYRID	02370	PP 002A/B	PUMP SEAL	04/28/10	2453		05/02/10	05/03/10	2453	WORK ORDER	OPN	05/03/10	
27-PYRID	02370	PP 002A/B	PUMP SEAL	04/28/10	2453		05/04/10	05/05/10	50	REPLACE VALVE STEM	RPD	05/05/10	
27-PYRID	02370	PP 002A/B	PUMP SEAL	06/01/10		VSBL	06/02/10	06/02/10	10	ADJUST SEAL	RPD	06/02/10	
27-PYRID	02371	PP 002A/B	PUMP SEAL	05/11/10	2449		05/14/10	05/14/10	8	ADJUST SEAL	RPD	05/14/10	
27-PYRID	02437.04	MT-620.212	SCREWED CONNECTOR	05/26/10	9130		DOR 5/26/10	05/26/10	13600	TIGHTEN CONNECTOR	S/D	06/10/10	
27-PYRID	02437.04	MT-620.212	SCREWED CONNECTOR	05/26/10	9130		06/30/10	07/16/10	7	ENVIRONMENTALLY REMOVED HYDRO SERVI	RPD	07/16/10	repair during shutdown with remonitor on start-up
27-PYRID	02437.07	MT-620.212	SCREWED CONNECTOR	05/26/10	375		DOR 5/26/10	05/26/10	286	TIGHTEN CONNECTOR	S/D	06/10/10	
27-PYRID	02437.07	MT-620.212	SCREWED CONNECTOR	05/26/10	375		06/30/10	07/16/10	5	ENVIRONMENTALLY REMOVED HYDRO SERVI	RPD	07/16/10	repair during shutdown with remonitor on start-up
27-PYRID	02444.06	MT-620.212	CAP	06/01/10	11200		06/04/10	06/04/10	24	TIGHTEN CAP	RPD	06/04/10	
27-PYRID	02459.01	MT-620.212	FLANGE	06/01/10	12400		06/03/10	06/04/10	32767	SEAL JOB	OPN	06/04/10	
27-PYRID	02459.01	MT-620.212	FLANGE	06/01/10	12400		07/09/10	07/16/10	35	ENVIRONMENTALLY REMOVED HYDRO SERVI	RPD	07/16/10	on DORL and remonitored on start-up
27-PYRID	02511	PP-624.159A	VALVE PACKING	06/04/10	68	VSBL	06/09/10	06/09/10	4	WASH SEAL	RPD	06/09/10	
27-PYRID	02612.01	TK254	FLANGE	06/09/10	790		06/11/10	06/11/10	715	TIGHTEN FLANGE	OPN	06/11/10	
27-PYRID	02612.01	TK254	FLANGE	06/09/10	790		06/15/10	06/21/10	8	REPLACE GASKET	RPD	06/21/10	remonitor not within 24 hrs
27-PYRID	02622.04	pp622.242	CAP	06/09/10	1686		06/11/10	06/11/10	9	TIGHTEN CAP	RPD	06/11/10	
27-PYRID	02667	pp622.270a	VALVE PACKING	06/10/10	2476		06/11/10	06/11/10	142	TIGHTEN PACKING	RPD	06/11/10	
27-PYRID	02691	pp622.270a	VALVE PACKING	06/10/10	627		06/11/10	06/11/10	54	TIGHTEN PACKING	RPD	06/11/10	

Area	Tag #	Equip.	Part Leaking	Monitor Date	Monitor Reading	VSBL Leaks	Repair Attempt Date	Remonitor Date	Repair Reading	Repair Method	Status	Status Date	Comment
27-PYRID	02698	pp622.270b	VALVE PACKING	06/10/10	663		06/11/10	06/11/10	746	TIGHTEN PACKING	OPN	06/11/10	
27-PYRID	02698	pp622.270b	VALVE PACKING	06/10/10	663		06/13/10	06/21/10	3	REPLACE VALVE	RPD	06/21/10	valve replaced on 6/13/10-no quasi-directed maintenance requirement (EMSI monitored new valve)
27-PYRID	02748	pp622.270b	VALVE PACKING	06/25/10	6976		06/30/10	06/30/10	18	REPLACE VALVE	RPD	06/30/10	
27-PYRID	02750	pp622.270b	VALVE PACKING	06/25/10	291		06/30/10	06/30/10	20	REPLACE VALVE	RPD	06/30/10	
27-PYRID	02794.18	622.242	HATCH	06/25/10	1042		06/30/10	06/30/10	32767	REPLACE GASKET	OPN	06/30/10	
27-PYRID	02794.18	622.242	HATCH	06/25/10	1042		07/09/10	07/09/10	31	REPLACE GASKET	RPD	07/09/10	
27-PYRID	02845	PP622.102	VALVE PACKING	06/21/10	440		06/25/10	06/25/10	298	TIGHTEN PACKING	OPN	06/25/10	on DORL
27-PYRID	02893	PP622.045B	VALVE PACKING	06/21/10	499		06/25/10	06/25/10	329	TIGHTEN PACKING	OPN	06/25/10	
27-PYRID	2118G	TK-262	VALVE PACKING	05/23/10	32100		05/26/10	05/25/10	5	CLEAN/LUBE VALVE STEM	OPN	05/25/10	repair attempt date incorrectly recorded
27-PYRID	2118G	TK-262	VALVE PACKING	05/23/10	32100		07/06/10	07/16/10	4	REPLACE VALVE	RPD	07/16/10	valve replaced on 7/6/10-no quasi-directed maintenance requirement (EMSI monitored new valve)
27-PYRID	2614C	MT620.251	VALVE PACKING	06/09/10	1060		06/11/10	06/11/10	867	TIGHTEN PACKING	OPN	06/11/10	
27-PYRID	2614C	MT620.251	VALVE PACKING	06/09/10	1060		06/23/10	06/24/10	5	REPLACE VALVE	RPD	06/24/10	
27-PYRID	03574	PP 308A	TUBING CONNECTOR	04/28/10	956		04/30/10	04/30/10	1556	TIGHTEN CONNECTOR	OPN	04/30/10	
27-PYRID	03574	PP 308A	TUBING CONNECTOR	04/28/10	956		05/13/10	05/13/10	4	ENVIRONMENTALLY REMOVED HYDRO SERVI	OHS	05/13/10	
27-PYRID	03574	PP 308A	TUBING CONNECTOR	04/28/10	956		05/13/10	05/13/10	2661	TIGHTEN CONNECTOR	OPN	05/13/10	
27-PYRID	03574	PP 308A	TUBING CONNECTOR	04/28/10	956		05/14/10	05/14/10	4	REPLACE CONNECTOR	RPD	05/14/10	
27-PYRID	03794	PP 604A	PUMP SEAL	05/11/10	1263		05/14/10	05/14/10	90	REPLACE GASKET	RPD	05/14/10	
27-PYRID	03852	MT 607	AGITATOR SEAL	04/28/10	975		04/30/10	04/30/10	873	TIGHTEN PACKING	OPN	04/30/10	
27-PYRID	03852	MT 607	AGITATOR SEAL	04/28/10	975		05/11/10	05/11/10	135	TIGHTEN PACKING	RPD	05/11/10	
29-UTILI	01082	MT 069	VALVE PACKING	05/25/10		VSBL	05/26/10	05/26/10	4	TIGHTEN PACKING	RPD	05/26/10	
29-UTILI	01237.02	MT 066	HATCH	04/21/10	19800		04/21/10	04/21/10	2500	TIGHTEN HATCH	RPD	04/21/10	
41-CYANO	00024.01	MT-600.211	HATCH	06/03/10	31900		06/07/10	06/08/10	34	REPLACE GASKET	RPD	06/08/10	
41-CYANO	00025.05	MT-600.213	HATCH	06/03/10	10200		06/07/10	06/08/10	869	REPLACE GASKET	OPN	06/08/10	
41-CYANO	00025.05	MT-600.213	HATCH	06/03/10	10200		06/11/10	06/11/10	7	TIGHTEN HATCH	RPD	06/11/10	

Area	Tag #	Equip.	Part Leaking	Monitor Date	Monitor Reading	VSBL Leaks	Repair Attempt Date	Remonitor Date	Repair Reading	Repair Method	Status	Status Date	Comment
41-CYANO	00044	PP-213A	PUMP SEAL	06/01/10	30700	VSBL	06/03/10	06/04/10	2	ENVIRONMENTALLY REMOVED HYDRO SERVI	OPN	06/04/10	
41-CYANO	00044	PP-213A	PUMP SEAL	06/01/10	30700	VSBL	06/07/10	06/07/10	5	REPLACE VALVE STEM	RPD	06/07/10	
41-CYANO	00051	PP-213B	PUMP SEAL	05/17/10		VSBL	05/20/10	05/20/10	4	REPLACE VALVE STEM	RPD	05/20/10	
41-CYANO	00060	PP-213C	PUMP SEAL	04/21/10	687	VSBL	04/24/10	04/24/10	25000	REPLACE VALVE STEM	OPN	04/24/10	
41-CYANO	00060	PP-213C	PUMP SEAL	04/21/10	687	VSBL	05/04/10	05/05/10	16	TIGHTEN CONNECTOR	RPD	05/05/10	
41-CYANO	00164	PP-006D	PUMP SEAL	06/23/10	689		06/27/10	06/28/10	3	REPLACE VALVE STEM	RPD	06/28/10	
41-CYANO	00171	PP-006C	PLUG	04/21/10	769		04/23/10	04/23/10	8	TIGHTEN PLUG	RPD	04/23/10	
41-CYANO	00175.01	PP-006C	SCREWED CONNECTOR	06/02/10	2880		06/04/10	06/04/10	619	TIGHTEN SCREWED CONNECTOR	OPN	06/04/10	
41-CYANO	00175.01	PP-006C	SCREWED CONNECTOR	06/02/10	2880		06/08/10	06/08/10	3	REPLACE VALVE	RPD	06/08/10	
41-CYANO	00194.01	PP-006C	FLANGE	06/02/10	581		06/04/10	06/04/10	739	TIGHTEN FLANGE	OPN	06/04/10	
41-CYANO	00194.01	PP-006C	FLANGE	06/02/10	581		06/08/10	06/08/10	50	ENVIRONMENTALLY REMOVED HYDRO SERVI	OPN	06/08/10	
41-CYANO	00194.01	PP-006C	FLANGE	06/02/10	581		06/11/10	06/11/10	116	TIGHTEN FLANGE	RPD	06/11/10	
41-CYANO	00213	PP-010A	PUMP SEAL	06/29/10		VSBL	06/29/10	06/29/10	5	OTHER (SPECIFY IN COMMENTS)	RPD	06/29/10	
41-CYANO	00269.05	MS-6	SCREWED CONNECTOR	06/02/10	17500		06/04/10	06/04/10	16300	TIGHTEN SCREWED CONNECTOR	OPN	06/04/10	
41-CYANO	00269.05	MS-6	SCREWED CONNECTOR	06/02/10	17500		06/08/10	06/08/10	3	ENVIRONMENTALLY REMOVED HYDRO SERVI	OPN	06/08/10	
41-CYANO	00269.05	MS-6	SCREWED CONNECTOR	06/02/10	17500		06/11/10	06/11/10	15	TIGHTEN SCREWED CONNECTOR	RPD	06/11/10	
41-CYANO	01712	PP-600.02X	PUMP SEAL	04/22/10	3872		04/27/10	04/27/10	5	REPLACE VALVE STEM	RPD	04/27/10	
41-CYANO	01718.03	MT-600.12	SCREWED CONNECTOR	06/24/10	2631		06/29/10	06/29/10	111	TIGHTEN SCREWED CONNECTOR	RPD	06/29/10	
41-CYANO	03924	PP-600.002	VALVE PACKING	05/11/10	1868		05/14/10	05/14/10	1598	CLEAN VALVE	OPN	05/14/10	
41-CYANO	03924	PP-600.002	VALVE PACKING	05/11/10	1868		05/17/10	05/18/10	3	TIGHTEN PACKING	RPD	05/18/10	

APPENDIX C

THIRD-PARTY LEAK DETECTION AND REPAIR AUDIT REPORT

# Third-Party Leak Detection and Repair Audit

## Vertellus Agriculture & Nutrition Specialties LLC

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PROJECT #: JJ0942.250

PREPARED FOR:  
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PREPARED BY:  
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ISSUE DATE:  
June 18, 2010



**THIRD-PARTY LEAK DETECTION  
AND REPAIR AUDIT  
VERTELLUS AGRICULTURE & NUTRITION  
SPECIALTIES LLC  
INDIANAPOLIS, INDIANA  
AUGUST MACK PROJECT NUMBER JJ0942.250**

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**LEAK DETECTION  
AND REPAIR AUDIT  
VERTELLUS AGRICULTURE & NUTRITION  
SPECIALTIES LLC  
INDIANAPOLIS, INDIANA  
AUGUST MACK PROJECT NUMBER JJ0942.250**

**INTRODUCTION**

August Mack Environmental, Inc. (August Mack) has completed the 2010 third-party Leak Detection and Repair (LDAR) audit at the Vertellus Agriculture & Nutrition Specialties LLC (Vertellus) facility located in Indianapolis, Indiana. The LDAR audit was performed to comply with the requirements set forth in the Consent Decree (CD) with the United States Environmental Protection Agency (USEPA), Civil Action No. 1:09-cv-1030 SEB-TAB as lodged on August 21, 2009 and effective December 1, 2009. The third-party LDAR Audit Commencement Date was February 19, 2010. Audit activities were completed with the issuance of this final report on June 18, 2010.

As required by Section K of the CD, Vertellus must retain a third-party to conduct an LDAR audit once every twelve months. Each LDAR audit shall include:

- A review of compliance with all applicable LDAR requirements;
- A review of whether any pieces of equipment are not included in the LDAR program that are required to be included;
- Verification that equipment was monitored at the appropriate frequency;
- Verification that proper documentation and sign-offs have been recorded for equipment placed on the Delay of Repair (DOR) list;
- Confirm that all repairs have been completed within the required periods;
- A review of monitoring data and equipment counts for feasibility and unusual trends;
- Verification that proper calibration records and monitoring instrument maintenance information are maintained;

- Verification that other LDAR program records are maintained as required; and,
- Comparative monitoring and calculation of comparative monitoring percentages and ratios.

The comparative monitoring portions of the 2010 audit apply to Covered Equipment in Plant 27, as required by the CD. The LDAR regulations review applies to the facility-wide LDAR program and the remaining portions of the CD apply to the Covered Process Units (Plant 27 and Plant 41). Comparative monitoring of Covered Equipment in Plant 41 will be performed in the 2011 third-party audit. In addition to Plant 27 and Plant 41, the Vertellus LDAR program also consists of the Utilities Plant (Plant 29), the Vinylpyridine (VP) Plant (Plant 40), the Wheeler Plant/Spec Chem (Plant 47) and Amino Pyridine (AP) Plant (Plant 48).

### LDAR REGULATIONS REVIEW

The various process units (plants) at the Vertellus facility are subject to multiple LDAR regulations. As required by the CD, monitoring frequencies specified by the CD come into force no later than nine months after the Date of Lodging and thus are effective starting in May 2010. Table 1 identifies each of the plants to which LDAR regulations apply and lists the applicable LDAR requirements.

**TABLE 1**  
**Process Unit LDAR Applicability**

Process Unit	Applicable LDAR Requirements
Plant 27	40 CFR Part 63, Subpart H (HON); Consent Decree
Plant 29	40 CFR Part 264/265, Subpart BB
Plant 40	40 CFR Part 61, Subpart J; 40 CFR Part 265, Subpart BB
Plant 41	40 CFR Part 63, Subpart GGG (Pharma); Consent Decree
Plant 47	40 CFR Part 265, Subpart BB
Plant 48	40 CFR Part 265, Subpart BB

Vertellus has incorporated into the facility-wide LDAR program the requirements of the various applicable LDAR regulations. By incorporating the Enhanced LDAR requirements of the CD as well as the requirements of HON; Pharma; 40 CFR Part 61, Subpart J; and 40 CFR Part 264/265, Subpart BB into the facility-wide LDAR program, Vertellus ensures compliance with all applicable LDAR regulations. A review of the LDAR regulations listed in Table 1 as compared to the facility-wide program was completed and August Mack confirmed that Vertellus has identified the most stringent requirements that apply to each process unit and equipment type. The Vertellus LDAR database has been populated with the regulatory leak definitions and the periodic monitoring frequency for each equipment type subject to LDAR regulations.

### **QA/QC REQUIREMENTS REVIEW**

In accordance with the CD, August Mack reviewed compliance with Quality Assurance and Quality Control (QA/QC) requirements as described in Subparagraphs 41.a through 41.g. Each item was reviewed as described below. Subparagraph 41.h is not required to be reviewed as part of the third-party audit.

#### ***Inclusion in LDAR Program***

As required by CD Subparagraph 41.a, August Mack reviewed whether any pieces of equipment that are required to be in the LDAR program are not included in the LDAR program. This review was performed at the time of the comparative monitoring. The field monitoring technicians identified equipment during the comparative monitoring that was not tagged and for which an associated Tag ID could not be identified. The items which were noted as not tagged were then reviewed to determine if the equipment is required to be included in the Vertellus LDAR program. Several pieces of equipment were identified by field monitoring technicians as not being tagged in the field.

Through follow-up reviews of the LDAR database with Vertellus personnel, the majority of the pieces of equipment were confirmed as included in the LDAR program. According to Vertellus personnel, additional tags have been ordered to ensure that all pieces of equipment are tagged as necessary. At the time of this audit report, several pieces of equipment in the area of Tanks 240, 241, 250, 251, 252 and 253 were still being investigated to confirm their presence in the database.

### *Monitoring Frequency*

As required by CD Subparagraph 41.b, August Mack verified that equipment was monitored at the appropriate frequency. The monitoring records in the LDAR database were reviewed with Emission Monitoring Service, Inc. (EMSI) monitoring technician Joe McHugh. A randomly selected sample of database entries for each equipment type was reviewed for both Plant 27 and Plant 41 monitoring performed since the lodging of the CD. The equipment types reviewed included pumps, agitators, valves, connectors, and open-ended lines at the closure device (OELCDs).

In accordance with CD Subparagraph 15.c, pumps in Plant 27 and Plant 41 are required to be monitored monthly. Based on the sample of database records for five pumps in the Covered Units, pumps are being monitored at the required monthly interval. Monitoring as required by the CD began in April 2010.

In accordance with CD Subparagraph 15.c, agitators in Plant 27 and Plant 41 are required to be monitored monthly. Based on the sample of database records for two agitators, agitators are being monitored at the required monthly interval. Monitoring as required by the CD began in April 2010.

In accordance with CD Subparagraph 15.a, valves in Plant 27 and Plant 41 are required to be monitored quarterly. Based on the sample of database records for four valves in Plant 27, valves are being monitored at the required quarterly interval. Monitoring of valves was initiated in the second quarter of 2010. Monitoring of valves in Plant 41 is scheduled to be performed in June 2010.

In accordance with CD Subparagraph 15.b, connectors in Plant 27 and Plant 41 are required to be monitored semi-annually. Based on the sample of database records for six connectors in Plant 27, connectors are being monitored at the required semi-annual interval. Monitoring of connectors was initiated in the first half of 2010. Monitoring of connectors in Plant 41 is scheduled to be performed in June 2010.

In accordance with CD Subparagraph 15.d, OELCDs in Plant 27 and Plant 41 are required to be monitored quarterly. Based on the sample of database records for four OELCDs (one cap, two plugs, and one blank flange), monitoring of the OELCDs was initiated in the second quarter of 2010. Vertellus is in compliance with the monitoring requirements of the CD for OELCDs; however, OELCDs are currently categorized as “connectors” in the LDAR database. Since the monitoring frequency for connectors is semi-annual, the OELCDs will not be flagged as requiring monitoring at the appropriate interval. This could result in noncompliance with the CD due to the OELCDs not being monitored at the required frequency.

### *Delay of Repair*

As required by CD Subparagraph 41.c, August Mack verified that proper documentation and sign-offs have been recorded for all equipment placed on the Delay of Repair (DOR) list. Required sign-off documentation from the relevant process unit supervisor (or person of similar authority) indicating that the piece of Covered Equipment is technically infeasible to repair without a process unit shutdown was

reviewed for validity. The work orders for the two pieces of equipment currently on the DOR list were reviewed and confirmed as having been signed off on by the Process Team Leader.

Periodic monitoring, at the same monitoring frequency as other pieces of equipment of the same type, is required for equipment placed on the DOR list. Two connectors (Tag ID 03530.1 and Tag ID 03530.10) are currently on the DOR list. Since the monitoring frequency for connectors is semi-annual, Vertellus is in compliance with the periodic monitoring requirement for connectors on the DOR list given the connectors are remonitored by the end of 2010.

Work orders were reviewed to ensure repair (or replacement, repacking, improvement, or elimination, as described in the CD) has been completed on the Covered Equipment by the end of the next process shutdown. There have not been any process shutdowns since the items were placed on the DOR list; therefore, this requirement does not apply at the time of the 2010 third-party audit. The audit did identify that the work orders do not reference the unique tag number for connectors. Both of the connectors for which work orders were reviewed were identified as Tag ID 03530, where the unique connector identifier to the right of the decimal was dropped. Further investigation confirmed that the full unique tag number was visible in SAP; however, only the digits to the left of the decimal appear on the printed work order. Vertellus personnel had begun work on developing a solution prior to the completion of the LDAR audit. In addition, for the work orders reviewed, it appeared that information on monitoring had been entered into SAP for one of the pieces of equipment; however, only partial information had been entered in SAP for the other piece of equipment. Since the LDAR database is used to maintain compliance with LDAR requirement, this does not represent a specific compliance issue. August Mack recommends that Vertellus ensures data is tracked in a consistent manner in both the LDAR database and SAP.

### *Repair Timeframes*

As required by CD Subparagraph 41.d, August Mack verified that repairs have been performed in the required periods. Vertellus utilizes an LDAR database that includes an indicator on the main menu that identifies the number of open leaks, the number of units for which repairs are overdue, the number of units for which repairs are due on the current day, the number of units for which repairs are due the following day, and the number of units for which repairs are due within two to three days. On the date that the database was reviewed, June 2, the database indicated a total of seven (7) leaks identified but not yet repaired. None of these were overdue or required a repair attempt within the subsequent two days. Additionally, the date of all repair attempts, repair methods used, screening values, and DOR information is tracked in the LDAR monitoring database and based on the sample of records reviewed, all required information appeared to be present.

LDAR regulations and the CD require that the first attempt at repair must be performed no later than 5 days after the leak has been detected. Adherence to this requirement was verified through a review of the records in the LDAR database. The database review was performed with the EMSI monitoring technician and database entries for a sample of Covered Equipment identified as leaking were reviewed. The sample consisted of equipment at both Plant 27 and Plant 41. For each entry reviewed, the first attempt at repair was documented as being performed within five days of the leak being detected.

The final attempt at repair must be performed within 15 days after the leak has been detected or the equipment may be placed on the DOR list. During the database review with the EMSI monitoring technician, database entries for a sample of Covered Equipment identified as leaking was reviewed. The sample consisted of equipment at both Plant 27 and Plant 41. For each entry reviewed, the final attempt at repair was

completed within 15 days of the leak being detected, with the exception of the two connectors (Tag ID 03530.1 and Tag ID 03530.10) placed on the aforementioned DOR list.

### *Monitoring Feasibility and Unusual Trends*

As required by CD Subparagraph 41.e, August Mack reviewed monitoring data and equipment counts for feasibility and unusual trends. Detailed monitoring reports were reviewed for April 28, May 11, and May 12 of 2010. The monitoring reports provided counts of the number of units monitored on each of the monitoring dates and the time spent monitoring each of the pieces of equipment. Based on the data reviewed, 38 points were monitored on April 28; 296 points were monitored on May 11; and 482 points were monitored on May 12. Given that the maximum number of points monitored on a given day was 482 and assuming an 8-hour workday, this equates to approximately one minute per monitoring point. Since the time spent on most pieces of equipment is typically less than 30 seconds, this count is considered feasible. The audit team did not identify any unusual trends in the monitoring.

### *Calibration Records and Instrument Maintenance*

As required by CD Subparagraph 41.f, August Mack verified that proper calibration records and monitoring instrument maintenance information is maintained. Calibration records were reviewed for monitoring performed by EMSI between April 19 and May 29 of 2010. A review of the records indicates that the monitoring equipment was calibrated each day prior to initiating monitoring for that day. Calibration records are maintained on file by EMSI at the Vertellus facility. Monitoring instrument maintenance information was not available for review during the audit.

### *Additional LDAR Program Records*

As required by CD Subparagraph 41.g, August Mack verified that other LDAR program records are maintained as required. Documentation of the required quarterly QA/QC audits performed by Vertellus was reviewed as part of the third-party audit. First quarter records were complete and indicate compliance with the QA/QC requirements of the CD. Since the third-party audit was completed during the second quarter, the second quarter documentation was not checked for completeness as not all of the reviews had been completed by Vertellus. August Mack did verify that the second quarter QA/QC review has been initiated.

As part of the calibration log review, August Mack also verified that the individual calibration logs completed by EMSI for monitoring performed at Vertellus contained all required information. All reviewed calibration logs included the daily certification statement required by Paragraph 40 of the CD and were signed by the monitoring technician. In addition, all calibration logs completed on May 3 and later included documentation of the calibration drift assessment performed at the end of each monitoring day. In each case the calibration drift assessment indicated a drift of less than 10%, which is considered acceptable.

### **COMPARATIVE MONITORING**

Comparative Monitoring of Covered Equipment to satisfy the requirement of the Vertellus CD, Paragraph 44, was performed by August Mack at Vertellus Plant 27 on Tuesday, May 11 through Friday, May 14. Field activities, including equipment calibration, monitoring and documentation, were performed by Staff Scientist Eric Hunter and Staff Engineer Jordan Eldridge of August Mack. A summary of field activities is included as Appendix A. Comparative monitoring equipment calibration logs are included as Appendix B.

A total of 928 pieces of Covered Equipment in Plant 27 were monitored during the four day comparative monitoring period. The equipment monitored consisted of 15 pumps, 324 valves, 1 agitator, and 588 connectors. This represents approximately 39% of pumps, 47% of valves, 100% of agitators, and 19% of connectors in Plant 27 monitored as part of the Vertellus LDAR historical monitoring program. Comparative monitoring, calculation of a historic average leak percentage and calculation of a comparative monitoring leak ratio is not required for OELCDs by the CD during the 2010 audit due to the unavailability of historic monitoring data. Comparative Monitoring leak percentages determined by August Mack during the 2010 audit are provided in Table 2. Comparative monitoring data is included as Appendix C.

**TABLE 2**  
**Plant 27 Comparative Monitoring**

<b>Equipment Type</b>	<b>Number Monitored</b>	<b>Number Leaking</b>	<b>Comparative Monitoring Audit Leak Percentage</b>	<b>Leak Definition</b>
Valve	324	2	0.6%	250 ppm
Pump	15	1	6.7%	500 ppm
Agitator	1	0	0.0%	500 ppm
Connector	588	4	0.7%	250 ppm
OELCD*	N/A	N/A	N/A	250 ppm

\*OELCD: In only the first LDAR audit, Vertellus shall not be required to undertake comparative monitoring on OELCDs or calculated a Comparative Monitoring Leak Ratio for OELCDs because of the unavailability of historic, average leak percentages for OELCDs. LDAR audits after the first audit shall include reviewing the Facility's compliance with this ELP.

For the Covered Process Unit audited during the 2010 third-party LDAR audit (Plant 27) the historic, average leak percentage from prior monitoring event was calculated for each equipment type. This calculation is based on monitoring performed by Vertellus during the regular periodic monitoring immediately preceding the comparative monitoring. The average number monitored and average number leaking is based on the preceding four (4) periods for valves, twelve (12) periods for pumps, twelve (12)

periods for agitators, and two (2) periods for connectors. Historic periodic monitoring leak percentages determined by Vertellus are provided in Table 3 below.

**TABLE 3**  
**Plant 27 Historic Periodic Monitoring**

<b>Equipment Type</b>	<b>Average Number Monitored</b>	<b>Average Number Leaking</b>	<b>Historic Average Leak Percentage</b>
Valve	690	5	0.7%
Pump	38	1.1	2.9%
Agitator	1	0	0.0%
Connector	3,087	7	0.2%
OELCD*	N/A	N/A	N/A

\*OELCD: In only the first LDAR audit, Vertellus shall not be required to undertake comparative monitoring on OELCDs or calculated a Comparative Monitoring Leak Ratio for OELCDs because of the unavailability of historic, average leak percentages for OELCDs. LDAR audits after the first audit shall include reviewing the Facility's compliance with this ELP.

For each Covered Equipment Type in each Covered Process Unit, the Comparative Monitoring Leak Ratio was calculated. The Comparative Monitoring Leak Ratio is the ratio of the comparative monitoring leak percentage shown in Table 2 to the historic periodic monitoring leak percentage shown in Table 3 for each Covered Equipment Type. The Comparative Monitoring Leak Ratio for each equipment type in Plant 27 is provided in Table 4 below.

**TABLE 4**  
**Plant 27 Comparative Monitoring Leak Ratio**

<b>Equipment Type</b>	<b>Comparative Monitoring Audit Leak Percentage</b>	<b>Historic Average Leak Percentage</b>	<b>Comparative Monitoring Leak Ratio</b>
Valve	0.6%	0.7%	0.9
Pump	6.7%	2.9%	2.3
Agitator*	0.0%	0.0%	0.0
Connector	0.7%	0.2%	3.4
OELCD**	N/A	N/A	N/A

\* In accordance with the Consent Decree, Paragraph 44.c, "if a calculated ratio yields an infinite result, it shall be assumed that one leaking piece of equipment was found in the process unit through historic monitoring during the 12-month period before the audit and the ratio shall be recalculated."

\*\*OELCD: In only the first LDAR audit, Vertellus shall not be required to undertake comparative monitoring on OELCDs or calculate a Comparative Monitoring Leak Ratio for OELCDs because of the unavailability of historic, average leak percentages for OELCDs. LDAR audits after the first audit shall include reviewing the Facility's compliance with this ELP.

In accordance with Consent Decree Subparagraph 46.a "Requirements of a CAP", Vertellus is required to include in the preliminary Corrective Action Plan (CAP) all of the actions that have been taken or will be taken to address the systemic causes of a Comparative Monitoring Leak Ratio of 3.0 or higher. Based on the Comparative Monitoring Leak Ratios presented in Table 4, connectors were identified as having a Comparative Monitoring Leak Ratio of greater than 3.0.

### **SUMMARY OF AUDIT RESULTS**

August Mack completed the on-site portion of the third-party LDAR audit of the Vertellus facility on June 2, 2010. With all audit activities being completed June 18, 2010, prior to the LDAR Audit Completion Date, which is defined in the CD, Subparagraph 9.s, as 120 days after the LDAR Audit Commencement Date. A summary of the LDAR audit results is provided below.

- **LDAR Regulations Review:** No issues were identified with respect to application of LDAR regulations in general. Statement of compliance takes into

account changes and improvements being actively put into place as a result of the CD.

- **QA/QC Requirements Review:**

- August Mack identified several pieces of equipment in Plant 27 that were not tagged in the field with LDAR tags. August Mack confirmed with Vertellus that many of the untagged pieces of equipment were included in the LDAR database, and that they would be tagged. At the time of the audit report, several pieces of equipment were still pending confirmation with respect to applicability of LDAR requirements and their inclusion in the LDAR program.
- No current issues were identified with respect to monitoring frequency of the various equipment types. However, currently Vertellus has OELCDs listed in the LDAR database as “connectors”. Since connectors have a semi-annual monitoring frequency and OELCDs have a quarterly monitoring frequency, this could result in insufficient monitoring of the OELCDs in the future. August Mack recommends updating the LDAR database so that OELCDs are properly categorized.
- The DOR process in place at Vertellus appears to be in compliance with CD and other LDAR requirements. At the time of the audit, the SAP database did not print out the full tag number for connectors on the printed work orders, despite tracking the number in the database.
- No issues were identified with respect to repair timeframes at the Vertellus facility. The facility appears to be in compliance with CD and other LDAR requirements.
- No issues were identified with respect to monitoring feasibility or unusual trends in monitoring or monitoring results.
- No issues were identified with respect to calibration records for monitoring equipment used by Vertellus or contractor personnel.

Instrument maintenance records were not available for review and should be maintained on file by Vertellus.

- No issues were identified with respect to other LDAR program records.
- **Comparative Monitoring:** Comparative monitoring resulted in comparable leak percentages for valves and agitators as in the historic monitoring performed by Vertellus.
  - Pumps were identified as having a higher leak percentage than the historic monitoring indicated. Due to the small number of pumps in Plant 27, the leak percentage is greatly influenced by each leak identified. The resulting Comparative Monitoring Leak Ratio was 2.3; however, since the Comparative Monitoring Leak Ratio is less than 3.0, inclusion of specific corrective actions with respect to pumps is not required in the CAP.
  - Connectors were identified as having a higher leak percentage than the historic monitoring indicated. The resulting Comparative Monitoring Leak ratio was 3.4. Since the Comparative Monitoring Leak Ratio for connectors is 3.0 or higher, Vertellus is required to include details of corrective actions in the CAP to be developed. Vertellus currently has in place an active program to replace and upgrade connectors that are part of the facility LDAR program.

## **APPENDIX A**

### **Summary of Field Activities**

## Summary of Field Activities

Equipment monitoring for the Comparative Monitoring requirement of the Vertellus Consent Decree was performed by August Mack at Vertellus Plant 27 on Tuesday, May 11 through Friday, May 14. Field activities, including equipment calibration, monitoring and documentation, were performed by Staff Scientist Eric Hunter and Staff Engineer Jordan Eldridge of August Mack.

### *Monitoring Equipment*

A Thermo Scientific TVA-1000B (FID) was used for the onsite monitoring. The FID was calibrated using zero-air and methane-in-air span gases at 100 ppm, 500 ppm and 5,000 ppm (0.5%) concentrations. Daily calibration of the FID was performed each day prior to comparative monitoring activities using the zero-air and the three span gases. Calibration was recorded on the calibration log by field personnel. The calibration performed on Friday, May 14 was performed, but not recorded on the log; however, the record of calibration was downloaded from the TVA-1000B data-logger and has been included to supplement the calibration log.

At the end the monitoring day, a calibration drift check was performed using a span gas and documented in the field book. The calibration drift check on May 11 was performed using the 500 ppm methane in air and resulted in a reading of 480 ppm, a drift of 4%. The calibration drift check on May 12 was performed using the 100 ppm methane-in-air and resulted in a reading of 110 ppm, a drift of 10%. The calibration drift check on May 13 was not documented by field personnel but provided a measurement that was sufficiently close to the calibration gas concentration that the personnel determined the FID was reading accurately. On May 14 the FID hydrogen fuel ran out after completion of the monitoring, but prior to field personnel being able to complete the calibration drift check. No calibration drift check was performed on May 14.

### *Monitoring Methodology*

Prior to initiating monitoring in an area of Plant 27, monitoring personnel recorded background VOC concentrations at least six (6) feet away from the equipment to be monitored for leaks. Background concentrations of VOCs were approximately 3.0 – 4.0 ppm in the process areas. Actual background VOC concentrations were documented in the field manual for background measurements taken in significantly different locations or when the background concentration was identified as having changed significantly. In cases where the background concentration was within the drift of the TVA-1000B when moving between pieces of equipment to be monitored, the background was assumed to be unchanged from the previous documented background concentration.

## **APPENDIX B**

### **Comparative Monitoring Calibration Logs**

100

[illegible]

# AUGUST MACK ENVIRONMENTAL, INC.

## DAILY CALIBRATION LOG

CALIBRATION:                      DATE 5/11/10 TIME 9:00 am

CALIBRATING TECHNICIAN      Eric Hunter

### CALIBRATION GASES

	Used for Cal.	Expires	Lot #/Part #
Zero-Air	EH	May-2013	0-013-82 / P1002
100 ppm Methane in Air	EH	8/16/2012	925073 / 10406000
500 ppm Methane in Air	EH	May-2013	9-344-62 / J1971500PA
5,000 ppm Methane in Air	EH	5/6/2014	FAK-150A-5000 / 35-5000A-17L

### END OF DAY CALIBRATION CHECK

	Reading	Technician
Zero-Air		
100 ppm Methane in Air		
500 ppm Methane in Air	480 ppm	EH
5,000 ppm Methane in Air		

FID Used: Thermo-Scientific TVA-1000B

# AUGUST MACK ENVIRONMENTAL, INC.

## DAILY CALIBRATION LOG

CALIBRATION:                      DATE 5/12/10      TIME 1:15 pm

CALIBRATING TECHNICIAN      Eric Hunter

### CALIBRATION GASES

	Used for Cal.	Expires	Lot #/Part #
Zero-Air	EH	May-2013	0-013-82 / P1002
100 ppm Methane in Air	EH	8/16/2012	925073 / 10406000
500 ppm Methane in Air	EH	May-2013	9-344-62 / J1971500PA
5,000 ppm Methane in Air	EH	5/6/2014	FAK-150A-5000 / 35-5000A-17L

### END OF DAY CALIBRATION CHECK

	Reading	Technician
Zero-Air		
100 ppm Methane in Air	110 ppm	EH
500 ppm Methane in Air		
5,000 ppm Methane in Air		

FID Used: Thermo-Scientific TVA-1000B

# AUGUST MACK ENVIRONMENTAL, INC.

## DAILY CALIBRATION LOG

CALIBRATION:                      DATE 5/13/10 TIME 8:00 am

CALIBRATING TECHNICIAN      Eric Hunter

### CALIBRATION GASES

	Used for Cal.	Expires	Lot #/Part #
Zero-Air	EH	May-2013	0-013-82 / P1002
100 ppm Methane in Air	EH	8/16/2012	925073 / 10406000
500 ppm Methane in Air	EH	May-2013	9-344-62 / J1971500PA
5,000 ppm Methane in Air	EH	5/6/2014	FAK-150A-5000 / 35-5000A-17L

### END OF DAY CALIBRATION CHECK

	Reading	Technician
Zero-Air		
100 ppm Methane in Air		
500 ppm Methane in Air		
5,000 ppm Methane in Air		

FID Used: Thermo-Scientific TVA-1000B

CALIBRATION DATA  
VER= 1.00

## FID CALIBRATION:

CALIB TYPE	KNOWN CONC	CALIB DATE/TIME	MEASURED CALIB VALUE
ZERO	0.00 PPM	14 MAY 10 09:30:29	3642 COUNTS OK
SPAN1	100.00 PPM	14 MAY 10 09:32:32	17863 COUNTS OK
SPAN2	500 PPM	14 MAY 10 09:34:15	73917 COUNTS OK
SPAN3	0.50 %	14 MAY 10 09:37:39	730906 COUNTS OK

END

*Eric D. Hunt* - Calibrating Technician

## **APPENDIX C**

### **Comparative Monitoring Data**

VOC	DATA				FID			FID			EQUIP
	DATE		TIME	TAG	BACKGROUND			CONCENTRATION			TYPE
11	MAY	10	10:35:58	2027	3	PPM	OK	3.2	PPM	OK	V
11	MAY	10	10:46:19	2028	3	PPM	OK	2.69	PPM	OK	V
11	MAY	10	10:48:57	2029	3	PPM	OK	3.07	PPM	OK	V
11	MAY	10	10:51:33	2030	3	PPM	OK	3.4	PPM	OK	V
11	MAY	10	10:56:38	2036	3	PPM	OK	3.44	PPM	OK	V
11	MAY	10	11:09:52	2042B	3	PPM	OK	2.61	PPM	OK	C
11	MAY	10	11:21:24	2055A	3	PPM	OK	3.02	PPM	OK	C
11	MAY	10	11:23:12	2056A	3	PPM	OK	2.75	PPM	OK	C
11	MAY	10	11:24:49	2056B	3	PPM	OK	2.66	PPM	OK	C
11	MAY	10	11:28:58	2047A	3	PPM	OK	3.17	PPM	OK	C
11	MAY	10	11:32:04	2049A	3	PPM	OK	3.69	PPM	OK	C
11	MAY	10	11:33:38	2049B	3	PPM	OK	2.74	PPM	OK	C
11	MAY	10	11:42:33	2003A	3	PPM	OK	3.02	PPM	OK	C
11	MAY	10	11:44:44	2003B	3	PPM	OK	3.01	PPM	OK	C
11	MAY	10	11:46:13	2003	3	PPM	OK	2.65	PPM	OK	V
11	MAY	10	11:48:17	2004	3	PPM	OK	2.81	PPM	OK	V
11	MAY	10	11:50:22	2006	3	PPM	OK	2.55	PPM	OK	V
11	MAY	10	11:52:55	2014	3	PPM	OK	2.98	PPM	OK	V
11	MAY	10	11:54:23	2014A	3	PPM	OK	3.25	PPM	OK	C
11	MAY	10	11:55:44	2014B	3	PPM	OK	2.53	PPM	OK	C
11	MAY	10	11:57:33	2012	3	PPM	OK	2.6	PPM	OK	V
11	MAY	10	11:58:41	2011	3	PPM	OK	2.75	PPM	OK	V
11	MAY	10	12:02:01	2013A	3	PPM	OK	3.18	PPM	OK	C
11	MAY	10	12:02:57	2013B	3	PPM	OK	2.66	PPM	OK	C
11	MAY	10	12:04:02	2013C	3	PPM	OK	2.45	PPM	OK	C
11	MAY	10	12:09:21	2020	3	PPM	OK	10.77	PPM	OK	P
11	MAY	10	12:12:35	2020A	3	PPM	OK	2.62	PPM	OK	C
11	MAY	10	12:13:50	2020B	3	PPM	OK	3.4	PPM	OK	C
11	MAY	10	12:15:46	2018	3	PPM	OK	3.09	PPM	OK	V
11	MAY	10	12:17:16	2018A	3	PPM	OK	2.89	PPM	OK	C
11	MAY	10	12:18:15	2018B	3	PPM	OK	2.85	PPM	OK	C
11	MAY	10	13:43:38	2091	3	PPM	OK	3.05	PPM	OK	P
11	MAY	10	13:45:45	2096	3	PPM	OK	2.73	PPM	OK	C
11	MAY	10	13:46:56	2096A	3	PPM	OK	1.96	PPM	OK	C
11	MAY	10	13:48:42	2099	3	PPM	OK	2.94	PPM	OK	V
11	MAY	10	13:49:51	2099A	3	PPM	OK	3.01	PPM	OK	C
11	MAY	10	13:51:09	2099B	3	PPM	OK	3.05	PPM	OK	C
11	MAY	10	13:54:01	2090	3	PPM	OK	2.11	PPM	OK	C
11	MAY	10	13:55:22	2090A	3	PPM	OK	2.53	PPM	OK	C
11	MAY	10	13:58:08	2089	3	PPM	OK	2.67	PPM	OK	V
11	MAY	10	14:00:47	2084	3	PPM	OK	2.84	PPM	OK	V
11	MAY	10	14:02:03	2084A	3	PPM	OK	2.98	PPM	OK	C
11	MAY	10	14:03:15	2084B	3	PPM	OK	2.96	PPM	OK	C
11	MAY	10	14:04:49	2083	3	PPM	OK	2.65	PPM	OK	V
11	MAY	10	14:05:46	2083A	3	PPM	OK	2.61	PPM	OK	C
11	MAY	10	14:06:49	2083B	3	PPM	OK	2.54	PPM	OK	C
11	MAY	10	14:09:06	2079	3	PPM	OK	3.12	PPM	OK	V
11	MAY	10	14:14:45	2079A	3	PPM	OK	48.57	PPM	OK	C
11	MAY	10	14:17:10	2079B	3	PPM	OK	4.09	PPM	OK	C
11	MAY	10	14:19:23	2080	3	PPM	OK	3.35	PPM	OK	V
11	MAY	10	14:24:56	2067A	3	PPM	OK	4.37	PPM	OK	C

11	MAY	10	14:26:15	2067B	3	PPM	OK	3.56	PPM	OK	C
11	MAY	10	14:28:00	2067	3	PPM	OK	3.99	PPM	OK	V
11	MAY	10	14:29:41	2067C	3	PPM	OK	4.36	PPM	OK	C
11	MAY	10	14:30:56	2067D	3	PPM	OK	23.52	PPM	OK	C
11	MAY	10	14:34:01	2066	3	PPM	OK	6.04	PPM	OK	V
11	MAY	10	14:35:39	2066A	3	PPM	OK	5.57	PPM	OK	C
11	MAY	10	14:36:52	2066B	3	PPM	OK	5.18	PPM	OK	C
11	MAY	10	14:41:18	2110	3	PPM	OK	4.64	PPM	OK	V
11	MAY	10	14:42:28	2111	3	PPM	OK	4.97	PPM	OK	V
11	MAY	10	14:43:38	2109	3	PPM	OK	4.76	PPM	OK	V
11	MAY	10	14:44:42	2108	3	PPM	OK	4.56	PPM	OK	V
11	MAY	10	14:51:22	2172	3.68	PPM	OK	4.14	PPM	OK	V
11	MAY	10	14:53:41	2172A	3.68	PPM	OK	3.8	PPM	OK	C
11	MAY	10	14:54:57	2172B	3.68	PPM	OK	3.91	PPM	OK	C
11	MAY	10	14:56:16	2172C	3.68	PPM	OK	4.11	PPM	OK	C
11	MAY	10	14:57:42	2171	3.68	PPM	OK	3.76	PPM	OK	V
11	MAY	10	14:59:19	2171A	3.68	PPM	OK	3.85	PPM	OK	C
11	MAY	10	15:00:13	2171B	3.68	PPM	OK	3.8	PPM	OK	C
11	MAY	10	15:00:59	2171C	3.68	PPM	OK	3.92	PPM	OK	C
11	MAY	10	15:03:48	2169	3.68	PPM	OK	3.96	PPM	OK	V
11	MAY	10	15:05:24	2169A	3.68	PPM	OK	4.05	PPM	OK	C
11	MAY	10	15:07:27	2170	3.68	PPM	OK	4.05	PPM	OK	V
11	MAY	10	15:08:42	2170A	3.68	PPM	OK	3.89	PPM	OK	C
11	MAY	10	15:10:20	2170B	3.68	PPM	OK	3.71	PPM	OK	C
11	MAY	10	15:13:39	2221	3.68	PPM	OK	3.12	PPM	OK	V
11	MAY	10	15:14:37	2221A	3.68	PPM	OK	3.25	PPM	OK	C
11	MAY	10	15:15:36	2221B	3.68	PPM	OK	3.67	PPM	OK	C
11	MAY	10	15:17:36	2216	3.68	PPM	OK	3.62	PPM	OK	V
11	MAY	10	15:18:34	2216A	3.68	PPM	OK	3.72	PPM	OK	C
11	MAY	10	15:19:33	2216B	3.68	PPM	OK	3.96	PPM	OK	C
11	MAY	10	15:20:57	2214	3.68	PPM	OK	3.58	PPM	OK	P
11	MAY	10	15:23:55	2173	3.68	PPM	OK	3.3	PPM	OK	V
11	MAY	10	15:25:26	2173A	3.68	PPM	OK	3.34	PPM	OK	C
11	MAY	10	15:26:22	2173B	3.68	PPM	OK	3.36	PPM	OK	C
11	MAY	10	15:27:21	2178	3.68	PPM	OK	3.32	PPM	OK	C
11	MAY	10	15:29:24	2179	3.68	PPM	OK	3.14	PPM	OK	V
11	MAY	10	15:30:22	2179A	3.68	PPM	OK	2.78	PPM	OK	C
11	MAY	10	15:41:50	2179B	3.68	PPM	OK	53.19	PPM	OK	C
11	MAY	10	15:43:58	2186	3.68	PPM	OK	7.68	PPM	OK	V
11	MAY	10	15:47:04	2185	3.68	PPM	OK	8.11	PPM	OK	V
11	MAY	10	15:49:42	2184	3.68	PPM	OK	7.79	PPM	OK	V
11	MAY	10	15:50:40	2184A	3.68	PPM	OK	7.28	PPM	OK	C
11	MAY	10	15:51:55	2184B	3.68	PPM	OK	6.95	PPM	OK	C
11	MAY	10	16:00:17	2297	3.68	PPM	OK	6.55	PPM	OK	P
11	MAY	10	16:02:47	2313	3.68	PPM	OK	7.74	PPM	OK	P
11	MAY	10	16:04:07	2319	3.68	PPM	OK	7.52	PPM	OK	V
11	MAY	10	16:05:32	2318	3.68	PPM	OK	7.29	PPM	OK	V
11	MAY	10	16:06:52	2299	3.68	PPM	OK	7.52	PPM	OK	V
11	MAY	10	16:08:22	2301	3.68	PPM	OK	6.77	PPM	OK	V
11	MAY	10	16:09:12	2302	3.68	PPM	OK	6.55	PPM	OK	V
11	MAY	10	16:10:26	2302A	3.68	PPM	OK	6.11	PPM	OK	C
11	MAY	10	16:11:18	2302B	3.68	PPM	OK	6.52	PPM	OK	C
11	MAY	10	16:13:14	2306	3.68	PPM	OK	6.44	PPM	OK	V
11	MAY	10	16:18:24	2314	3.68	PPM	OK	6.64	PPM	OK	V
11	MAY	10	16:19:17	2315	3.68	PPM	OK	6.32	PPM	OK	V

11	MAY	10	16:20:17	2317	3.68	PPM	OK	6.62	PPM	OK	V
11	MAY	10	16:21:14	2318	3.68	PPM	OK	6.24	PPM	OK	V
11	MAY	10	16:22:07	2319	3.68	PPM	OK	5.88	PPM	OK	V
11	MAY	10	16:25:27	2329A	3.68	PPM	OK	6.41	PPM	OK	C
11	MAY	10	16:26:18	2329B	3.68	PPM	OK	6.01	PPM	OK	C
11	MAY	10	16:27:51	2328A	3.68	PPM	OK	5.83	PPM	OK	C
11	MAY	10	16:29:05	2328B	3.68	PPM	OK	6.21	PPM	OK	C
11	MAY	10	16:29:56	2328C	3.68	PPM	OK	6.26	PPM	OK	C
11	MAY	10	16:31:57	2339A	3.68	PPM	OK	7.35	PPM	OK	C
11	MAY	10	16:33:46	2341A	3.68	PPM	OK	5.88	PPM	OK	C
11	MAY	10	16:34:46	2344A	3.68	PPM	OK	5.82	PPM	OK	C
12	MAY	10	15:22:09	2266	3.68	PPM	OK	0.7	PPM	OK	V
12	MAY	10	15:23:07	2266A	3.68	PPM	OK	0.62	PPM	OK	C
12	MAY	10	15:25:16	2256	3.68	PPM	OK	1.16	PPM	OK	V
12	MAY	10	15:28:33	2263	3.68	PPM	OK	0.92	PPM	OK	P
12	MAY	10	15:29:27	2260	3.68	PPM	OK	1.44	PPM	OK	V
12	MAY	10	15:30:19	2260A	3.68	PPM	OK	1.46	PPM	OK	C
12	MAY	10	15:31:01	2260B	3.68	PPM	OK	1.39	PPM	OK	C
12	MAY	10	15:33:12	2233	3.68	PPM	OK	1.53	PPM	OK	V
12	MAY	10	15:34:13	2234	3.68	PPM	OK	1.53	PPM	OK	V
12	MAY	10	15:35:19	2234A	3.68	PPM	OK	1.73	PPM	OK	C
12	MAY	10	15:36:06	2234B	3.68	PPM	OK	2.07	PPM	OK	C
12	MAY	10	15:38:19	2244	3.68	PPM	OK	1.43	PPM	OK	P
12	MAY	10	15:39:17	2241	3.68	PPM	OK	1.37	PPM	OK	V
12	MAY	10	15:39:59	2245	3.68	PPM	OK	0.93	PPM	OK	V
12	MAY	10	15:40:40	2246	3.68	PPM	OK	1	PPM	OK	V
12	MAY	10	15:43:06	2361	3.68	PPM	OK	1.31	PPM	OK	C
12	MAY	10	15:44:23	2363	3.68	PPM	OK	1.78	PPM	OK	V
12	MAY	10	15:45:09	2363A	3.68	PPM	OK	1.55	PPM	OK	C
12	MAY	10	15:45:50	2363B	3.68	PPM	OK	1.71	PPM	OK	C
12	MAY	10	15:48:17	2362	3.68	PPM	OK	1.28	PPM	OK	V
12	MAY	10	15:49:27	2362A	3.68	PPM	OK	1.72	PPM	OK	C
12	MAY	10	15:50:22	2362B	3.68	PPM	OK	1.64	PPM	OK	C
12	MAY	10	15:51:44	2378	3.68	PPM	OK	1.4	PPM	OK	V
12	MAY	10	15:52:45	2378A	3.68	PPM	OK	1.46	PPM	OK	C
12	MAY	10	15:53:20	2378B	3.68	PPM	OK	1.49	PPM	OK	C
12	MAY	10	15:54:27	2376	3.68	PPM	OK	1.88	PPM	OK	V
12	MAY	10	15:55:14	2376A	3.68	PPM	OK	1.99	PPM	OK	C
12	MAY	10	15:55:52	2376B	3.68	PPM	OK	1.64	PPM	OK	C
12	MAY	10	15:56:42	2375	3.68	PPM	OK	1.54	PPM	OK	V
12	MAY	10	15:57:56	2380	3.68	PPM	OK	1.72	PPM	OK	V
12	MAY	10	15:59:13	2380A	3.68	PPM	OK	1.78	PPM	OK	C
12	MAY	10	15:59:49	2380B	3.68	PPM	OK	1.33	PPM	OK	C
12	MAY	10	16:00:56	2381	3.68	PPM	OK	1.45	PPM	OK	V
12	MAY	10	16:04:42	2371	3.68	PPM	OK	2.36	PPM	OK	P
12	MAY	10	16:06:46	2370	3.68	PPM	OK	2.93	PPM	OK	P
12	MAY	10	16:09:31	2371	3.68	PPM	OK	5.57	PPM	OK	P
12	MAY	10	16:11:52	2366	3.68	PPM	OK	4.09	PPM	OK	V
12	MAY	10	16:12:45	2367	3.68	PPM	OK	2.97	PPM	OK	V
12	MAY	10	16:13:51	2367A	3.68	PPM	OK	2.45	PPM	OK	C
12	MAY	10	16:14:46	2365	3.68	PPM	OK	2.68	PPM	OK	V
12	MAY	10	16:15:52	2365A	3.68	PPM	OK	3.54	PPM	OK	C
12	MAY	10	16:16:40	2365B	3.68	PPM	OK	3.92	PPM	OK	C
12	MAY	10	16:19:15	2382	3.68	PPM	OK	8.1	PPM	OK	V
12	MAY	10	16:20:47	2382A	3.68	PPM	OK	2.26	PPM	OK	C

12	MAY	10	16:21:31	2382B	3.68	PPM	OK	1.84	PPM	OK	C
12	MAY	10	16:24:38	2386	3.68	PPM	OK	1.77	PPM	OK	V
12	MAY	10	16:25:21	2386A	3.68	PPM	OK	1.69	PPM	OK	C
12	MAY	10	16:26:20	2386B	3.68	PPM	OK	2.15	PPM	OK	C
12	MAY	10	16:29:02	2392	3.68	PPM	OK	1.71	PPM	OK	V
12	MAY	10	16:29:56	2392A	3.68	PPM	OK	2.11	PPM	OK	C
12	MAY	10	16:31:45	2392B	3.68	PPM	OK	28.48	PPM	OK	C
12	MAY	10	16:34:19	2393	3.68	PPM	OK	4.82	PPM	OK	V
12	MAY	10	16:35:26	2393A	3.68	PPM	OK	2.39	PPM	OK	C
12	MAY	10	16:36:59	2393B	3.68	PPM	OK	9.04	PPM	OK	C
12	MAY	10	16:38:00	2394	3.68	PPM	OK	2	PPM	OK	V
12	MAY	10	16:38:47	2394A	3.68	PPM	OK	1.91	PPM	OK	C
12	MAY	10	16:39:33	2394B	3.68	PPM	OK	1.65	PPM	OK	C
12	MAY	10	16:40:23	2394C	3.68	PPM	OK	1.46	PPM	OK	C
12	MAY	10	16:43:35	2288	3.68	PPM	OK	1.86	PPM	OK	P
12	MAY	10	16:45:08	2290	3.68	PPM	OK	1.59	PPM	OK	V
12	MAY	10	16:45:59	2290A	3.68	PPM	OK	2.44	PPM	OK	C
12	MAY	10	16:46:36	2290B	3.68	PPM	OK	2.35	PPM	OK	C
12	MAY	10	16:48:04	2292	3.68	PPM	OK	1.06	PPM	OK	V
12	MAY	10	16:48:48	2291	3.68	PPM	OK	0.99	PPM	OK	V
12	MAY	10	16:49:41	2291A	3.68	PPM	OK	1.28	PPM	OK	C
12	MAY	10	16:50:30	2293	3.68	PPM	OK	1.32	PPM	OK	V
12	MAY	10	16:51:03	2289	3.68	PPM	OK	1.28	PPM	OK	V
12	MAY	10	16:53:33	2287	3.68	PPM	OK	1.4	PPM	OK	P
12	MAY	10	16:54:38	2283	3.68	PPM	OK	1.28	PPM	OK	V
12	MAY	10	16:55:31	2282	3.68	PPM	OK	2	PPM	OK	V
12	MAY	10	16:56:20	2282A	3.68	PPM	OK	1.21	PPM	OK	C
12	MAY	10	16:57:07	2280	3.68	PPM	OK	1.47	PPM	OK	V
12	MAY	10	16:58:03	2285	3.68	PPM	OK	1.49	PPM	OK	V
12	MAY	10	16:59:11	2281	3.68	PPM	OK	1.37	PPM	OK	V
12	MAY	10	17:00:07	2281A	3.68	PPM	OK	1.45	PPM	OK	C
12	MAY	10	17:02:29	2281B	3.68	PPM	OK	2.26	PPM	OK	C
12	MAY	10	17:03:14	2281C	3.68	PPM	OK	1.91	PPM	OK	C
12	MAY	10	17:03:53	2281D	3.68	PPM	OK	2.22	PPM	OK	C
12	MAY	10	17:07:00	2281E	3.68	PPM	OK	1.87	PPM	OK	C
12	MAY	10	17:09:31	2269	3.68	PPM	OK	1.53	PPM	OK	P
12	MAY	10	17:10:31	2273	3.68	PPM	OK	1.72	PPM	OK	V
12	MAY	10	17:11:40	2273A	3.68	PPM	OK	2.29	PPM	OK	C
12	MAY	10	17:12:21	2273B	3.68	PPM	OK	1.78	PPM	OK	C
12	MAY	10	17:13:08	2274	3.68	PPM	OK	1.75	PPM	OK	V
12	MAY	10	17:14:02	2274A	3.68	PPM	OK	1.8	PPM	OK	C
12	MAY	10	17:14:44	2274B	3.68	PPM	OK	1.87	PPM	OK	C
12	MAY	10	17:15:30	2274C	3.68	PPM	OK	1.9	PPM	OK	C
12	MAY	10	17:17:51	2270	3.68	PPM	OK	1.89	PPM	OK	V
12	MAY	10	17:18:59	2267	3.68	PPM	OK	1.1	PPM	OK	V
12	MAY	10	17:19:56	2268	3.68	PPM	OK	1.09	PPM	OK	V
12	MAY	10	17:30:11	2590	1.12	PPM	OK	0.82	PPM	OK	V
12	MAY	10	17:31:44	2590A	1.12	PPM	OK	4.69	PPM	OK	C
12	MAY	10	17:32:27	2590B	1.12	PPM	OK	2.26	PPM	OK	C
12	MAY	10	17:33:26	2585	1.12	PPM	OK	1.96	PPM	OK	V
12	MAY	10	17:34:38	2582	1.12	PPM	OK	3.3	PPM	OK	V
12	MAY	10	17:35:23	2582A	1.12	PPM	OK	3.55	PPM	OK	C
12	MAY	10	17:36:01	2582B	1.12	PPM	OK	2.77	PPM	OK	C
12	MAY	10	17:36:38	2581	1.12	PPM	OK	2.63	PPM	OK	V
12	MAY	10	17:38:31	2641	1.12	PPM	OK	2.78	PPM	OK	P

12	MAY	10	17:39:52	2647	1.12	PPM	OK	99.18	PPM	OK	P
12	MAY	10	17:41:19	2648	1.12	PPM	OK	8.89	PPM	OK	V
12	MAY	10	17:42:31	2648A	1.12	PPM	OK	3.34	PPM	OK	C
12	MAY	10	17:44:59	2648B	1.12	PPM	OK	24.4	PPM	OK	C
12	MAY	10	17:47:05	2655	1.12	PPM	OK	3.11	PPM	OK	V
12	MAY	10	17:48:32	2655A	1.12	PPM	OK	18.04	PPM	OK	C
12	MAY	10	17:49:36	2655B	1.12	PPM	OK	23.67	PPM	OK	C
12	MAY	10	17:51:21	2646	1.12	PPM	OK	8.66	PPM	OK	V
12	MAY	10	17:52:51	2646A	1.12	PPM	OK	5.28	PPM	OK	C
12	MAY	10	17:53:57	2646B	1.12	PPM	OK	3.61	PPM	OK	C
12	MAY	10	17:55:28	2592	1.12	PPM	OK	4.07	PPM	OK	V
12	MAY	10	17:56:12	2593	1.12	PPM	OK	23.99	PPM	OK	V
12	MAY	10	17:58:48	2608	1.12	PPM	OK	1.79	PPM	OK	V
13	MAY	10	9:35:26	3507	1.12	PPM	OK	3.26	PPM	OK	V
13	MAY	10	9:36:31	3507A	1.12	PPM	OK	4	PPM	OK	C
13	MAY	10	9:37:14	3507B	1.12	PPM	OK	4.21	PPM	OK	C
13	MAY	10	9:38:52	3507C	1.12	PPM	OK	4.02	PPM	OK	C
13	MAY	10	9:40:45	3509	1.12	PPM	OK	4.09	PPM	OK	V
13	MAY	10	9:41:59	3509A	1.12	PPM	OK	4.25	PPM	OK	C
13	MAY	10	9:42:53	3509B	1.12	PPM	OK	4.47	PPM	OK	C
13	MAY	10	9:45:07	3512	1.12	PPM	OK	3.5	PPM	OK	V
13	MAY	10	9:46:00	3512A	1.12	PPM	OK	3.74	PPM	OK	C
13	MAY	10	9:46:52	3512B	1.12	PPM	OK	3.98	PPM	OK	C
13	MAY	10	9:49:05	3514	1.12	PPM	OK	3.78	PPM	OK	V
13	MAY	10	9:50:58	3514A	1.12	PPM	OK	3.16	PPM	OK	C
13	MAY	10	9:51:46	3514B	1.12	PPM	OK	2.8	PPM	OK	C
13	MAY	10	9:52:57	3516	1.12	PPM	OK	3.17	PPM	OK	V
13	MAY	10	9:53:42	3516A	1.12	PPM	OK	3.5	PPM	OK	C
13	MAY	10	9:54:31	3516B	1.12	PPM	OK	3.63	PPM	OK	C
13	MAY	10	9:58:23	3277	1.12	PPM	OK	4	PPM	OK	V
13	MAY	10	9:59:21	3276	1.12	PPM	OK	4.08	PPM	OK	V
13	MAY	10	10:01:21	3275	1.12	PPM	OK	3.6	PPM	OK	V
13	MAY	10	10:02:21	3274	1.12	PPM	OK	3.46	PPM	OK	V
13	MAY	10	10:03:20	3273	1.12	PPM	OK	3.54	PPM	OK	V
13	MAY	10	10:04:16	3572	1.12	PPM	OK	3.9	PPM	OK	V
13	MAY	10	10:05:18	3271	1.12	PPM	OK	4.12	PPM	OK	V
13	MAY	10	10:06:32	3270	1.12	PPM	OK	3.4	PPM	OK	V
13	MAY	10	10:07:28	3281	1.12	PPM	OK	3.64	PPM	OK	V
13	MAY	10	10:08:24	3282	1.12	PPM	OK	3.74	PPM	OK	V
13	MAY	10	10:09:29	3283	1.12	PPM	OK	3.3	PPM	OK	V
13	MAY	10	10:10:10	3284	1.12	PPM	OK	3.46	PPM	OK	V
13	MAY	10	10:11:26	3285	1.12	PPM	OK	3.67	PPM	OK	V
13	MAY	10	10:12:13	3286	1.12	PPM	OK	3.91	PPM	OK	V
13	MAY	10	10:13:03	3287	1.12	PPM	OK	3.72	PPM	OK	V
13	MAY	10	10:14:12	3297	1.12	PPM	OK	3.5	PPM	OK	V
13	MAY	10	10:15:18	3296	1.12	PPM	OK	3.88	PPM	OK	V
13	MAY	10	10:16:21	3295	1.12	PPM	OK	4.38	PPM	OK	V
13	MAY	10	10:18:19	3277A	1.12	PPM	OK	4.92	PPM	OK	C
13	MAY	10	10:19:30	3277B	1.12	PPM	OK	4.7	PPM	OK	C
13	MAY	10	10:20:29	3276A	1.12	PPM	OK	4.86	PPM	OK	C
13	MAY	10	10:21:27	3276B	1.12	PPM	OK	4.7	PPM	OK	C
13	MAY	10	10:23:17	3273A	1.12	PPM	OK	4.73	PPM	OK	C
13	MAY	10	10:24:24	3273B	1.12	PPM	OK	4.65	PPM	OK	C
13	MAY	10	10:25:36	3297A	1.12	PPM	OK	3.78	PPM	OK	C
13	MAY	10	10:26:29	3297B	1.12	PPM	OK	3.98	PPM	OK	C

13	MAY	10	10:27:13	3296A	1.12	PPM	OK	3.96	PPM	OK	C
13	MAY	10	10:28:07	3296B	1.12	PPM	OK	4.55	PPM	OK	C
13	MAY	10	10:29:15	3295A	1.12	PPM	OK	4.24	PPM	OK	C
13	MAY	10	10:30:04	3295B	1.12	PPM	OK	4.48	PPM	OK	C
13	MAY	10	10:35:46	3560A	1.12	PPM	OK	3.69	PPM	OK	C
13	MAY	10	10:36:33	3560B	1.12	PPM	OK	4.09	PPM	OK	C
13	MAY	10	10:37:32	3560C	1.12	PPM	OK	4.73	PPM	OK	C
13	MAY	10	10:38:35	3562A	1.12	PPM	OK	4.45	PPM	OK	C
13	MAY	10	10:39:20	3562B	1.12	PPM	OK	4.59	PPM	OK	C
13	MAY	10	10:40:13	3562C	1.12	PPM	OK	4.46	PPM	OK	C
13	MAY	10	10:41:10	3565A	1.12	PPM	OK	4.74	PPM	OK	C
13	MAY	10	10:41:58	3565B	1.12	PPM	OK	3.92	PPM	OK	C
13	MAY	10	10:42:47	3565C	1.12	PPM	OK	4.13	PPM	OK	C
13	MAY	10	11:26:13	3252	1.12	PPM	OK	3.26	PPM	OK	V
13	MAY	10	11:26:56	3252A	1.12	PPM	OK	3.18	PPM	OK	C
13	MAY	10	11:27:49	3252B	1.12	PPM	OK	3.04	PPM	OK	C
13	MAY	10	11:29:16	3253	1.12	PPM	OK	3.69	PPM	OK	V
13	MAY	10	11:30:23	3254	1.12	PPM	OK	3.36	PPM	OK	V
13	MAY	10	11:31:44	3254A	1.12	PPM	OK	3.31	PPM	OK	C
13	MAY	10	11:32:21	3254B	1.12	PPM	OK	3.31	PPM	OK	C
13	MAY	10	11:33:57	3255	1.12	PPM	OK	3.36	PPM	OK	V
13	MAY	10	11:34:37	3255A	1.12	PPM	OK	3	PPM	OK	C
13	MAY	10	11:35:12	3255B	1.12	PPM	OK	2.93	PPM	OK	C
13	MAY	10	11:35:46	3255C	1.12	PPM	OK	2.83	PPM	OK	C
13	MAY	10	11:37:07	3256	1.12	PPM	OK	3.23	PPM	OK	V
13	MAY	10	11:38:01	3256A	1.12	PPM	OK	3.54	PPM	OK	C
13	MAY	10	11:38:41	3256B	1.12	PPM	OK	4.05	PPM	OK	C
13	MAY	10	11:39:33	3256C	1.12	PPM	OK	3.66	PPM	OK	C
13	MAY	10	11:41:31	3255	1.12	PPM	OK	3.6	PPM	OK	V
13	MAY	10	11:42:40	3236	1.12	PPM	OK	3.39	PPM	OK	V
13	MAY	10	11:43:37	3234	1.12	PPM	OK	4.14	PPM	OK	V
13	MAY	10	11:44:45	3234A	1.12	PPM	OK	4.62	PPM	OK	C
13	MAY	10	11:45:50	3234B	1.12	PPM	OK	9.44	PPM	OK	C
13	MAY	10	11:47:20	3234C	1.12	PPM	OK	10.1	PPM	OK	C
13	MAY	10	11:48:39	3234D	1.12	PPM	OK	14.99	PPM	OK	C
13	MAY	10	11:50:05	3232	1.12	PPM	OK	4.46	PPM	OK	V
13	MAY	10	11:50:56	3233	1.12	PPM	OK	4.8	PPM	OK	V
13	MAY	10	11:52:10	3233A	1.12	PPM	OK	4.97	PPM	OK	C
13	MAY	10	11:53:14	3233B	1.12	PPM	OK	6.36	PPM	OK	C
13	MAY	10	11:54:17	3233C	1.12	PPM	OK	3.96	PPM	OK	C
13	MAY	10	11:55:15	3233D	1.12	PPM	OK	4.34	PPM	OK	C
13	MAY	10	11:57:44	3223	1.12	PPM	OK	4.46	PPM	OK	V
13	MAY	10	11:58:34	3223A	1.12	PPM	OK	4.42	PPM	OK	C
13	MAY	10	11:59:23	3223B	1.12	PPM	OK	4.3	PPM	OK	C
13	MAY	10	12:00:35	3222	1.12	PPM	OK	5.71	PPM	OK	V
13	MAY	10	12:01:21	3222A	1.12	PPM	OK	3.82	PPM	OK	C
13	MAY	10	12:02:20	3222B	1.12	PPM	OK	3.73	PPM	OK	C
13	MAY	10	12:03:17	3220	1.12	PPM	OK	4.47	PPM	OK	V
13	MAY	10	12:04:10	3220A	1.12	PPM	OK	4.81	PPM	OK	C
13	MAY	10	12:05:07	3220B	1.12	PPM	OK	4.77	PPM	OK	C
13	MAY	10	12:06:41	3221	1.12	PPM	OK	3.71	PPM	OK	V
13	MAY	10	12:07:36	3221A	1.12	PPM	OK	3.71	PPM	OK	C
13	MAY	10	12:08:14	3221B	1.12	PPM	OK	3.33	PPM	OK	C
13	MAY	10	12:09:42	3166	1.12	PPM	OK	3.62	PPM	OK	V
13	MAY	10	12:11:25	3166A	1.12	PPM	OK	3.89	PPM	OK	C

13	MAY	10	12:12:14	3166B	1.12	PPM	OK	3.54	PPM	OK	C
13	MAY	10	12:13:25	3167	1.12	PPM	OK	2.92	PPM	OK	V
13	MAY	10	12:14:14	3167A	1.12	PPM	OK	3.8	PPM	OK	C
13	MAY	10	12:15:10	3167B	1.12	PPM	OK	3.85	PPM	OK	C
13	MAY	10	12:15:59	3167C	1.12	PPM	OK	3.74	PPM	OK	C
13	MAY	10	12:17:33	3169	1.12	PPM	OK	3.12	PPM	OK	V
13	MAY	10	12:18:29	3169A	1.12	PPM	OK	3.41	PPM	OK	C
13	MAY	10	12:19:43	3169B	1.12	PPM	OK	2.9	PPM	OK	C
13	MAY	10	12:23:06	3199	1.12	PPM	OK	3.2	PPM	OK	V
13	MAY	10	12:24:38	3199A	1.12	PPM	OK	3.25	PPM	OK	C
13	MAY	10	12:25:38	3199B	1.12	PPM	OK	3.21	PPM	OK	C
13	MAY	10	12:26:55	3198	1.12	PPM	OK	3.06	PPM	OK	V
13	MAY	10	12:27:54	3198A	1.12	PPM	OK	2.82	PPM	OK	C
13	MAY	10	12:28:52	3198B	1.12	PPM	OK	3.02	PPM	OK	C
13	MAY	10	12:30:32	3200	1.12	PPM	OK	2.89	PPM	OK	V
13	MAY	10	12:31:45	3200A	1.12	PPM	OK	2.54	PPM	OK	C
13	MAY	10	12:32:38	3200B	1.12	PPM	OK	3.57	PPM	OK	C
13	MAY	10	12:33:48	3200C	1.12	PPM	OK	3.21	PPM	OK	C
13	MAY	10	12:34:54	3200D	1.12	PPM	OK	2.85	PPM	OK	C
13	MAY	10	12:36:43	3205	1.12	PPM	OK	3.25	PPM	OK	C
13	MAY	10	12:42:29	3185	1.12	PPM	OK	3.04	PPM	OK	V
13	MAY	10	12:43:38	3185A	1.12	PPM	OK	3.06	PPM	OK	C
13	MAY	10	12:44:36	3185B	1.12	PPM	OK	3.69	PPM	OK	C
13	MAY	10	12:45:27	3184	1.12	PPM	OK	3.54	PPM	OK	V
13	MAY	10	12:46:37	3184A	1.12	PPM	OK	3.07	PPM	OK	C
13	MAY	10	12:47:48	3184B	1.12	PPM	OK	3.46	PPM	OK	C
13	MAY	10	12:50:34	3218	1.12	PPM	OK	2.66	PPM	OK	V
13	MAY	10	12:51:45	3218A	1.12	PPM	OK	3.51	PPM	OK	C
13	MAY	10	12:52:25	3118B	1.12	PPM	OK	3.67	PPM	OK	C
13	MAY	10	12:53:33	3218C	1.12	PPM	OK	3.51	PPM	OK	C
13	MAY	10	12:56:15	3213	1.12	PPM	OK	4.04	PPM	OK	V
13	MAY	10	12:57:34	3213A	1.12	PPM	OK	3.5	PPM	OK	C
13	MAY	10	12:58:41	3213B	1.12	PPM	OK	3.69	PPM	OK	C
13	MAY	10	13:00:17	3213C	1.12	PPM	OK	4	PPM	OK	C
13	MAY	10	13:01:33	3213D	1.12	PPM	OK	3.58	PPM	OK	C
13	MAY	10	13:02:43	3213E	1.12	PPM	OK	4.14	PPM	OK	C
13	MAY	10	13:05:37	3215	1.12	PPM	OK	3.64	PPM	OK	V
13	MAY	10	13:07:00	3216	1.12	PPM	OK	3.06	PPM	OK	V
13	MAY	10	13:08:26	3214	1.12	PPM	OK	3.67	PPM	OK	V
13	MAY	10	13:09:21	3217	1.12	PPM	OK	3.88	PPM	OK	V
13	MAY	10	13:10:15	3224	1.12	PPM	OK	4.74	PPM	OK	V
13	MAY	10	13:11:09	3225	1.12	PPM	OK	3.79	PPM	OK	V
13	MAY	10	13:12:17	3226	1.12	PPM	OK	3.52	PPM	OK	V
13	MAY	10	13:12:55	3227	1.12	PPM	OK	3.56	PPM	OK	V
13	MAY	10	13:14:09	3229	1.12	PPM	OK	4.3	PPM	OK	V
13	MAY	10	13:15:37	3158	1.12	PPM	OK	3.79	PPM	OK	V
13	MAY	10	13:19:52	3159	1.12	PPM	OK	3.03	PPM	OK	V
13	MAY	10	13:20:47	3160	1.12	PPM	OK	3.16	PPM	OK	V
13	MAY	10	13:21:32	3161	1.12	PPM	OK	3.43	PPM	OK	V
13	MAY	10	13:22:54	3156	1.12	PPM	OK	3.08	PPM	OK	V
13	MAY	10	13:23:48	3157	1.12	PPM	OK	3.52	PPM	OK	V
13	MAY	10	13:25:04	3153	1.12	PPM	OK	3.21	PPM	OK	V
13	MAY	10	13:26:46	3162	1.12	PPM	OK	3.05	PPM	OK	V
13	MAY	10	13:27:42	3154	1.12	PPM	OK	3.44	PPM	OK	C
13	MAY	10	13:29:31	3238	1.12	PPM	OK	3.61	PPM	OK	V

13	MAY	10	13:30:43	3237	1.12	PPM	OK	4.52	PPM	OK	V
13	MAY	10	13:33:09	3239	1.12	PPM	OK	3.82	PPM	OK	V
13	MAY	10	13:34:30	3474	1.12	PPM	OK	3.72	PPM	OK	V
13	MAY	10	15:05:29	3425	1.12	PPM	OK	4.96	PPM	OK	V
13	MAY	10	15:06:32	3428	1.12	PPM	OK	4.33	PPM	OK	V
13	MAY	10	15:08:20	3428A	1.12	PPM	OK	3.42	PPM	OK	C
13	MAY	10	15:09:15	3428B	1.12	PPM	OK	2.53	PPM	OK	C
13	MAY	10	15:10:09	3428C	1.12	PPM	OK	2.94	PPM	OK	C
13	MAY	10	15:10:56	3428D	1.12	PPM	OK	2.45	PPM	OK	C
13	MAY	10	15:12:03	3069	1.12	PPM	OK	3.31	PPM	OK	V
13	MAY	10	15:13:03	3469A	1.12	PPM	OK	3.04	PPM	OK	C
13	MAY	10	15:14:09	3468	1.12	PPM	OK	2.58	PPM	OK	V
13	MAY	10	15:16:30	3462	1.12	PPM	OK	2.75	PPM	OK	V
13	MAY	10	15:17:48	3462A	1.12	PPM	OK	3.61	PPM	OK	C
13	MAY	10	15:19:18	3459	1.12	PPM	OK	2.79	PPM	OK	C
13	MAY	10	15:20:40	3461	1.12	PPM	OK	3.71	PPM	OK	C
13	MAY	10	15:22:42	3464A	1.12	PPM	OK	3.12	PPM	OK	C
13	MAY	10	15:23:40	3458	1.12	PPM	OK	2.96	PPM	OK	V
13	MAY	10	15:38:06	3835	1.12	PPM	OK	4.5	PPM	OK	V
13	MAY	10	15:38:58	3835A	1.12	PPM	OK	3.21	PPM	OK	C
13	MAY	10	15:39:39	3835B	1.12	PPM	OK	2.3	PPM	OK	C
13	MAY	10	15:40:34	3834	1.12	PPM	OK	2.6	PPM	OK	V
13	MAY	10	15:41:25	3834A	1.12	PPM	OK	3	PPM	OK	C
13	MAY	10	15:42:23	3834C	1.12	PPM	OK	6.32	PPM	OK	C
13	MAY	10	15:43:20	3834C	1.12	PPM	OK	3.42	PPM	OK	C
13	MAY	10	15:44:07	3834D	1.12	PPM	OK	3.79	PPM	OK	C
13	MAY	10	15:45:19	3833	1.12	PPM	OK	4.63	PPM	OK	C
13	MAY	10	15:46:14	3831	1.12	PPM	OK	3.58	PPM	OK	V
13	MAY	10	15:47:05	3832	1.12	PPM	OK	3.86	PPM	OK	V
13	MAY	10	15:47:57	3832A	1.12	PPM	OK	4.5	PPM	OK	C
13	MAY	10	15:48:50	3832B	1.12	PPM	OK	3.83	PPM	OK	C
13	MAY	10	15:49:57	3832C	1.12	PPM	OK	3.04	PPM	OK	C
13	MAY	10	15:52:46	3824	1.12	PPM	OK	7.49	PPM	OK	V
13	MAY	10	15:54:01	3823	1.12	PPM	OK	4.41	PPM	OK	V
13	MAY	10	15:55:09	3823A	1.12	PPM	OK	5.43	PPM	OK	C
13	MAY	10	15:55:49	3823B	1.12	PPM	OK	4.54	PPM	OK	C
13	MAY	10	15:56:44	3823C	1.12	PPM	OK	4.17	PPM	OK	C
13	MAY	10	15:57:39	3823D	1.12	PPM	OK	8.22	PPM	OK	C
13	MAY	10	15:59:48	3827	1.12	PPM	OK	3.67	PPM	OK	V
13	MAY	10	16:00:28	3827A	1.12	PPM	OK	5.42	PPM	OK	C
13	MAY	10	16:01:21	3827B	1.12	PPM	OK	13.85	PPM	OK	C
13	MAY	10	16:02:00	3828	1.12	PPM	OK	7.44	PPM	OK	V
13	MAY	10	16:02:51	3828A	1.12	PPM	OK	9.33	PPM	OK	C
13	MAY	10	16:03:33	3828B	1.12	PPM	OK	5.54	PPM	OK	C
13	MAY	10	16:04:18	3828C	1.12	PPM	OK	4.53	PPM	OK	C
13	MAY	10	16:06:18	3813	1.12	PPM	OK	6.23	PPM	OK	V
13	MAY	10	16:08:04	3810	1.12	PPM	OK	4.8	PPM	OK	V
13	MAY	10	16:08:49	3810A	1.12	PPM	OK	8.41	PPM	OK	C
13	MAY	10	16:09:50	3810B	1.12	PPM	OK	5.81	PPM	OK	C
13	MAY	10	16:10:51	3811	1.12	PPM	OK	5.46	PPM	OK	V
13	MAY	10	16:11:31	3811A	1.12	PPM	OK	5.71	PPM	OK	C
13	MAY	10	16:12:25	3811B	1.12	PPM	OK	5.81	PPM	OK	C
13	MAY	10	16:13:03	3811C	1.12	PPM	OK	7.53	PPM	OK	C
13	MAY	10	16:13:46	3812	1.12	PPM	OK	5.61	PPM	OK	V
13	MAY	10	16:14:25	3812A	1.12	PPM	OK	4.51	PPM	OK	C

13	MAY	10	16:15:08	3812B	1.12	PPM	OK	5.14	PPM	OK	C
14	MAY	10	10:06:15	3133	3.19	PPM	OK	3.11	PPM	OK	V
14	MAY	10	10:07:09	3132	3.19	PPM	OK	3.29	PPM	OK	V
14	MAY	10	10:07:47	3132A	3.19	PPM	OK	3.14	PPM	OK	C
14	MAY	10	10:08:18	3132B	3.19	PPM	OK	3.99	PPM	OK	C
14	MAY	10	10:09:05	3134	3.19	PPM	OK	3.61	PPM	OK	V
14	MAY	10	10:09:50	3134A	3.19	PPM	OK	4.02	PPM	OK	C
14	MAY	10	10:10:43	3134B	3.19	PPM	OK	4.7	PPM	OK	C
14	MAY	10	10:11:39	3131	3.19	PPM	OK	3.3	PPM	OK	V
14	MAY	10	10:12:29	3131A	3.19	PPM	OK	3.09	PPM	OK	C
14	MAY	10	10:13:23	3135	3.19	PPM	OK	4.04	PPM	OK	V
14	MAY	10	10:14:11	3135A	3.19	PPM	OK	4.7	PPM	OK	C
14	MAY	10	10:15:50	3135B	3.19	PPM	OK	3.76	PPM	OK	C
14	MAY	10	10:16:53	3136	3.19	PPM	OK	5.04	PPM	OK	V
14	MAY	10	10:17:34	3136A	3.19	PPM	OK	4.48	PPM	OK	C
14	MAY	10	10:18:44	3137	3.19	PPM	OK	5.18	PPM	OK	V
14	MAY	10	10:19:27	3137A	3.19	PPM	OK	3.35	PPM	OK	C
14	MAY	10	10:20:10	3137B	3.19	PPM	OK	4.17	PPM	OK	C
14	MAY	10	10:21:19	3137C	3.19	PPM	OK	5.75	PPM	OK	C
14	MAY	10	10:22:06	3137D	3.19	PPM	OK	3.07	PPM	OK	C
14	MAY	10	10:24:50	3139	3.19	PPM	OK	3.4	PPM	OK	V
14	MAY	10	10:26:10	3139A	3.19	PPM	OK	18.82	PPM	OK	C
14	MAY	10	10:27:10	3139B	3.19	PPM	OK	3.8	PPM	OK	C
14	MAY	10	10:28:51	3138	3.19	PPM	OK	6.94	PPM	OK	A
14	MAY	10	10:29:44	3138A	3.19	PPM	OK	4.51	PPM	OK	C
14	MAY	10	10:30:24	3138B	3.19	PPM	OK	3.76	PPM	OK	C
14	MAY	10	10:31:33	3138C	3.19	PPM	OK	3.68	PPM	OK	C
14	MAY	10	10:32:30	3138D	3.19	PPM	OK	2.9	PPM	OK	C
14	MAY	10	10:33:30	3138E	3.19	PPM	OK	3.04	PPM	OK	C
14	MAY	10	10:39:00	3127	3.19	PPM	OK	328	PPM	OK	V
14	MAY	10	10:40:54	3128	3.19	PPM	OK	15.12	PPM	OK	V
14	MAY	10	10:42:03	3126	3.19	PPM	OK	5.13	PPM	OK	V
14	MAY	10	10:44:30	3024	3.19	PPM	OK	8.97	PPM	OK	V
14	MAY	10	10:45:44	3024A	3.19	PPM	OK	4.99	PPM	OK	C
14	MAY	10	10:46:47	3024B	3.19	PPM	OK	7.48	PPM	OK	C
14	MAY	10	10:47:54	3028	3.19	PPM	OK	4.11	PPM	OK	V
14	MAY	10	10:48:51	3028A	3.19	PPM	OK	65.15	PPM	OK	C
14	MAY	10	10:49:34	3028C	3.19	PPM	OK	1275	PPM	OK	C
14	MAY	10	10:50:26	3028C	3.19	PPM	OK	44.46	PPM	OK	C
14	MAY	10	10:52:03	3025	3.19	PPM	OK	10.23	PPM	OK	V
14	MAY	10	10:53:14	3025A	3.19	PPM	OK	6.74	PPM	OK	C
14	MAY	10	10:53:58	3025B	3.19	PPM	OK	6.15	PPM	OK	C
14	MAY	10	10:54:49	3026	3.19	PPM	OK	5.85	PPM	OK	C
14	MAY	10	10:55:54	3026	3.19	PPM	OK	9.1	PPM	OK	C
14	MAY	10	10:56:41	3026A	3.19	PPM	OK	13.65	PPM	OK	C
14	MAY	10	10:57:33	3026B	3.19	PPM	OK	8.29	PPM	OK	C
14	MAY	10	10:59:00	3027	3.19	PPM	OK	93.85	PPM	OK	V
14	MAY	10	11:00:40	3027A	3.19	PPM	OK	228	PPM	OK	C
14	MAY	10	11:05:34	3027B	3.19	PPM	OK	8078	PPM	OK	C
14	MAY	10	11:07:05	3027C	3.19	PPM	OK	26.48	PPM	OK	C
14	MAY	10	11:08:06	3023	3.19	PPM	OK	12.54	PPM	OK	V
14	MAY	10	11:09:20	3023A	3.19	PPM	OK	10.07	PPM	OK	C
14	MAY	10	11:10:45	3038	3.19	PPM	OK	7.93	PPM	OK	C
14	MAY	10	11:11:37	3038A	3.19	PPM	OK	24.25	PPM	OK	C
14	MAY	10	11:12:51	3037	3.19	PPM	OK	11.08	PPM	OK	V

14	MAY	10	11:13:41	3037A	3.19	PPM	OK	7.43	PPM	OK	C
14	MAY	10	11:14:22	3037B	3.19	PPM	OK	17.25	PPM	OK	C
14	MAY	10	11:15:24	3037C	3.19	PPM	OK	15.69	PPM	OK	C
14	MAY	10	11:16:41	3039	3.19	PPM	OK	33.65	PPM	OK	V
14	MAY	10	11:17:46	3039A	3.19	PPM	OK	11.38	PPM	OK	C
14	MAY	10	11:18:43	3039B	3.19	PPM	OK	5.02	PPM	OK	C
14	MAY	10	11:20:17	3039C	3.19	PPM	OK	4.66	PPM	OK	C
14	MAY	10	11:21:18	3039D	3.19	PPM	OK	4.24	PPM	OK	C
14	MAY	10	11:24:07	3068A	3.19	PPM	OK	27.51	PPM	OK	C
14	MAY	10	11:25:20	3068	3.19	PPM	OK	4.78	PPM	OK	V
14	MAY	10	11:26:35	3058	3.19	PPM	OK	4.51	PPM	OK	V
14	MAY	10	11:27:30	3058A	3.19	PPM	OK	5.19	PPM	OK	C
14	MAY	10	11:28:11	3058B	3.19	PPM	OK	3.91	PPM	OK	C
14	MAY	10	11:29:02	3059	3.19	PPM	OK	5.09	PPM	OK	V
14	MAY	10	11:29:47	3059A	3.19	PPM	OK	17.37	PPM	OK	C
14	MAY	10	11:30:53	3060	3.19	PPM	OK	13.98	PPM	OK	V
14	MAY	10	11:31:35	3060A	3.19	PPM	OK	12	PPM	OK	C
14	MAY	10	11:32:24	3061	3.19	PPM	OK	13.29	PPM	OK	V
14	MAY	10	11:33:08	3061A	3.19	PPM	OK	8.26	PPM	OK	C
14	MAY	10	11:34:14	3062	3.19	PPM	OK	4.51	PPM	OK	V
14	MAY	10	11:34:55	3063	3.19	PPM	OK	4.73	PPM	OK	V
14	MAY	10	11:36:13	3064	3.19	PPM	OK	8.45	PPM	OK	V
14	MAY	10	11:37:00	3064A	3.19	PPM	OK	3.42	PPM	OK	C
14	MAY	10	11:37:43	3064B	3.19	PPM	OK	4.95	PPM	OK	C
14	MAY	10	11:38:34	3065	3.19	PPM	OK	4.07	PPM	OK	V
14	MAY	10	11:39:15	3065A	3.19	PPM	OK	4.19	PPM	OK	C
14	MAY	10	11:40:45	3057	3.19	PPM	OK	4.09	PPM	OK	C
14	MAY	10	11:42:06	3070	3.19	PPM	OK	5.64	PPM	OK	V
14	MAY	10	11:42:48	3070A	3.19	PPM	OK	4.63	PPM	OK	C
14	MAY	10	11:43:45	3070B	3.19	PPM	OK	4.19	PPM	OK	C
14	MAY	10	11:44:30	3071	3.19	PPM	OK	4.45	PPM	OK	V
14	MAY	10	11:45:16	3071A	3.19	PPM	OK	4.48	PPM	OK	C
14	MAY	10	11:46:05	3071B	3.19	PPM	OK	3.98	PPM	OK	C
14	MAY	10	11:46:51	3071C	3.19	PPM	OK	4.6	PPM	OK	C
14	MAY	10	11:48:56	3051	3.19	PPM	OK	4.81	PPM	OK	C
14	MAY	10	11:50:53	3047	3.19	PPM	OK	6.69	PPM	OK	V
14	MAY	10	11:51:58	3047A	3.19	PPM	OK	2029	PPM	OK	C
14	MAY	10	11:52:47	3047B	3.19	PPM	OK	27.55	PPM	OK	C
14	MAY	10	11:54:18	3050	3.19	PPM	OK	9.06	PPM	OK	V
14	MAY	10	11:55:09	3050A	3.19	PPM	OK	38.54	PPM	OK	C
14	MAY	10	11:56:16	3046	3.19	PPM	OK	5.79	PPM	OK	V
14	MAY	10	11:57:10	3046A	3.19	PPM	OK	8.6	PPM	OK	C
14	MAY	10	11:57:43	3046B	3.19	PPM	OK	6.9	PPM	OK	C
14	MAY	10	11:58:48	3045	3.19	PPM	OK	5.82	PPM	OK	V
14	MAY	10	11:59:39	3045A	3.19	PPM	OK	5.12	PPM	OK	C
14	MAY	10	12:00:24	3045B	3.19	PPM	OK	4.75	PPM	OK	C
14	MAY	10	12:01:21	3044	3.19	PPM	OK	7.16	PPM	OK	V
14	MAY	10	12:02:02	3044A	3.19	PPM	OK	4.09	PPM	OK	C
14	MAY	10	12:02:53	3044B	3.19	PPM	OK	11.49	PPM	OK	C
14	MAY	10	12:03:51	3044C	3.19	PPM	OK	15.3	PPM	OK	C
14	MAY	10	12:04:54	3043	3.19	PPM	OK	4.86	PPM	OK	V
14	MAY	10	12:05:51	3043A	3.19	PPM	OK	35.39	PPM	OK	C
14	MAY	10	12:06:45	3043B	3.19	PPM	OK	5.98	PPM	OK	C
14	MAY	10	12:08:03	3042	3.19	PPM	OK	7.12	PPM	OK	V
14	MAY	10	12:08:57	3042A	3.19	PPM	OK	12.14	PPM	OK	C

14	MAY	10	12:09:41	3042B	3.19	PPM	OK	12.47	PPM	OK	C
14	MAY	10	12:10:34	3042C	3.19	PPM	OK	6350	PPM	OK	C
14	MAY	10	12:12:27	3042D	3.19	PPM	OK	22.07	PPM	OK	C
14	MAY	10	12:13:12	3041	3.19	PPM	OK	10.9	PPM	OK	V
14	MAY	10	12:14:05	3041A	3.19	PPM	OK	7.83	PPM	OK	C
14	MAY	10	12:15:32	3040	3.19	PPM	OK	4.94	PPM	OK	V
14	MAY	10	12:16:16	3040A	3.19	PPM	OK	4.72	PPM	OK	C
14	MAY	10	12:16:46	3040B	3.19	PPM	OK	5.28	PPM	OK	C
14	MAY	10	13:26:40	3072	3.19	PPM	OK	3.84	PPM	OK	V
14	MAY	10	13:27:30	3072A	3.19	PPM	OK	6.46	PPM	OK	C
14	MAY	10	13:28:17	3072B	3.19	PPM	OK	5.59	PPM	OK	C
14	MAY	10	13:29:00	3072C	3.19	PPM	OK	5.79	PPM	OK	C
14	MAY	10	13:29:31	3073	3.19	PPM	OK	4.28	PPM	OK	V
14	MAY	10	13:30:07	3073A	3.19	PPM	OK	4.09	PPM	OK	C
14	MAY	10	13:30:46	3073C	3.19	PPM	OK	8.45	PPM	OK	C
14	MAY	10	13:31:24	3073C	3.19	PPM	OK	169	PPM	OK	C
14	MAY	10	13:33:56	3079	3.19	PPM	OK	30.31	PPM	OK	V
14	MAY	10	13:34:48	3076	3.19	PPM	OK	19.87	PPM	OK	V
14	MAY	10	13:35:31	3076A	3.19	PPM	OK	10.61	PPM	OK	C
14	MAY	10	13:36:21	3077	3.19	PPM	OK	6.91	PPM	OK	V
14	MAY	10	13:36:55	3077A	3.19	PPM	OK	9.58	PPM	OK	C
14	MAY	10	13:37:26	3077B	3.19	PPM	OK	10.63	PPM	OK	C
14	MAY	10	13:38:24	3074	3.19	PPM	OK	5.86	PPM	OK	V
14	MAY	10	13:39:34	3074A	3.19	PPM	OK	20.97	PPM	OK	C
14	MAY	10	13:40:14	3074B	3.19	PPM	OK	15.17	PPM	OK	C
14	MAY	10	13:40:55	3074C	3.19	PPM	OK	7.47	PPM	OK	C
14	MAY	10	13:41:28	3074D	3.19	PPM	OK	5.75	PPM	OK	C
14	MAY	10	13:42:06	3075	3.19	PPM	OK	4.21	PPM	OK	V
14	MAY	10	13:42:44	3075A	3.19	PPM	OK	4.04	PPM	OK	C
14	MAY	10	13:43:12	3075B	3.19	PPM	OK	3.92	PPM	OK	C
14	MAY	10	13:43:45	3075C	3.19	PPM	OK	5.71	PPM	OK	C
14	MAY	10	13:44:17	3075D	3.19	PPM	OK	8.47	PPM	OK	C
14	MAY	10	13:45:11	3081	3.19	PPM	OK	14.55	PPM	OK	V
14	MAY	10	13:45:42	3081A	3.19	PPM	OK	8.96	PPM	OK	C
14	MAY	10	13:46:26	3081B	3.19	PPM	OK	5.86	PPM	OK	C
14	MAY	10	13:47:38	3081C	3.19	PPM	OK	4.12	PPM	OK	C
14	MAY	10	13:48:26	3081D	3.19	PPM	OK	5.11	PPM	OK	C
14	MAY	10	13:48:57	3081E	3.19	PPM	OK	4.78	PPM	OK	C
14	MAY	10	13:49:37	3081F	3.19	PPM	OK	5.22	PPM	OK	C
14	MAY	10	13:50:10	3081G	3.19	PPM	OK	7.23	PPM	OK	C
14	MAY	10	13:50:45	3081H	3.19	PPM	OK	6.91	PPM	OK	C
14	MAY	10	13:51:20	3080	3.19	PPM	OK	8.31	PPM	OK	V
14	MAY	10	13:51:46	3080A	3.19	PPM	OK	6.79	PPM	OK	C
14	MAY	10	13:52:14	3080B	3.19	PPM	OK	10.69	PPM	OK	C
14	MAY	10	13:52:55	3080C	3.19	PPM	OK	12.57	PPM	OK	C
14	MAY	10	13:53:26	3080D	3.19	PPM	OK	7.13	PPM	OK	C
14	MAY	10	13:54:13	3080E	3.19	PPM	OK	7.35	PPM	OK	C
14	MAY	10	13:54:44	3080F	3.19	PPM	OK	15.65	PPM	OK	C
14	MAY	10	13:55:15	3080G	3.19	PPM	OK	14.8	PPM	OK	C
14	MAY	10	13:56:38	3082	3.19	PPM	OK	6.46	PPM	OK	V
14	MAY	10	13:57:06	3082A	3.19	PPM	OK	5.47	PPM	OK	C
14	MAY	10	13:57:37	3083	3.19	PPM	OK	21.18	PPM	OK	V
14	MAY	10	13:58:05	3083A	3.19	PPM	OK	6.76	PPM	OK	C
14	MAY	10	13:58:48	3086	3.19	PPM	OK	6.05	PPM	OK	V
14	MAY	10	13:59:21	3086A	3.19	PPM	OK	6.02	PPM	OK	C

14	MAY	10	13:59:53	3086B	3.19	PPM	OK	6.78	PPM	OK	C
14	MAY	10	14:02:22	3088	3.19	PPM	OK	44.51	PPM	OK	V
14	MAY	10	14:02:56	3088A	3.19	PPM	OK	33.2	PPM	OK	C
14	MAY	10	14:03:25	3089	3.19	PPM	OK	68.18	PPM	OK	V
14	MAY	10	14:03:56	3089A	3.19	PPM	OK	60.87	PPM	OK	C
14	MAY	10	14:05:59	3090	3.19	PPM	OK	103	PPM	OK	V
14	MAY	10	14:07:01	3090A	3.19	PPM	OK	37.02	PPM	OK	C
14	MAY	10	14:07:35	3090B	3.19	PPM	OK	21.6	PPM	OK	C
14	MAY	10	14:08:31	3091	3.19	PPM	OK	22.59	PPM	OK	V
14	MAY	10	14:09:01	3091A	3.19	PPM	OK	15.59	PPM	OK	C
14	MAY	10	14:09:29	3091B	3.19	PPM	OK	17.07	PPM	OK	C
14	MAY	10	14:10:28	3092	3.19	PPM	OK	35.82	PPM	OK	V
14	MAY	10	14:10:56	3092A	3.19	PPM	OK	8.8	PPM	OK	C
14	MAY	10	14:11:30	3092B	3.19	PPM	OK	11.49	PPM	OK	C
14	MAY	10	14:12:03	3092C	3.19	PPM	OK	7.92	PPM	OK	C
14	MAY	10	14:12:44	3092D	3.19	PPM	OK	7.68	PPM	OK	C
14	MAY	10	14:13:39	3092E	3.19	PPM	OK	6.27	PPM	OK	C
14	MAY	10	14:14:25	3092F	3.19	PPM	OK	22.23	PPM	OK	C
14	MAY	10	14:14:54	3092G	3.19	PPM	OK	11.93	PPM	OK	C
14	MAY	10	14:15:20	3093	3.19	PPM	OK	10.96	PPM	OK	V
14	MAY	10	14:16:01	3093A	3.19	PPM	OK	6.89	PPM	OK	C
14	MAY	10	14:16:31	3093B	3.19	PPM	OK	5.9	PPM	OK	C
14	MAY	10	14:17:07	3093C	3.19	PPM	OK	5.77	PPM	OK	C
14	MAY	10	14:17:48	3093D	3.19	PPM	OK	153	PPM	OK	C
14	MAY	10	14:18:45	3093E	3.19	PPM	OK	12.81	PPM	OK	C
14	MAY	10	14:19:18	3093F	3.19	PPM	OK	6.46	PPM	OK	C
14	MAY	10	14:20:07	3094	3.19	PPM	OK	8.09	PPM	OK	V
14	MAY	10	14:20:52	3094A	3.19	PPM	OK	9.11	PPM	OK	C
14	MAY	10	14:21:17	3094B	3.19	PPM	OK	6.95	PPM	OK	C
14	MAY	10	14:21:46	3094C	3.19	PPM	OK	6	PPM	OK	C
14	MAY	10	14:22:14	3094D	3.19	PPM	OK	4.86	PPM	OK	C
14	MAY	10	14:22:40	3095	3.19	PPM	OK	4.5	PPM	OK	V
14	MAY	10	14:23:12	3095A	3.19	PPM	OK	4.25	PPM	OK	C
14	MAY	10	14:23:36	3095B	3.19	PPM	OK	4.89	PPM	OK	C
14	MAY	10	14:24:05	3095C	3.19	PPM	OK	4.61	PPM	OK	C
14	MAY	10	14:24:33	3095D	3.19	PPM	OK	4.24	PPM	OK	C
14	MAY	10	14:25:00	3095E	3.19	PPM	OK	4.32	PPM	OK	C
14	MAY	10	14:25:27	3096	3.19	PPM	OK	6.02	PPM	OK	V
14	MAY	10	14:26:09	3096A	3.19	PPM	OK	4.35	PPM	OK	C
14	MAY	10	14:27:06	3096B	3.19	PPM	OK	13.59	PPM	OK	C
14	MAY	10	14:27:35	3096C	3.19	PPM	OK	5.26	PPM	OK	C
14	MAY	10	14:28:03	3096D	3.19	PPM	OK	11.97	PPM	OK	C
14	MAY	10	14:28:39	3096E	3.19	PPM	OK	6.93	PPM	OK	C
14	MAY	10	14:29:21	3097	3.19	PPM	OK	5.06	PPM	OK	V
14	MAY	10	14:29:57	3097A	3.19	PPM	OK	4.94	PPM	OK	C
14	MAY	10	14:30:23	3097B	3.19	PPM	OK	4.51	PPM	OK	C
14	MAY	10	14:30:46	3097C	3.19	PPM	OK	4.81	PPM	OK	C
14	MAY	10	14:31:19	3097D	3.19	PPM	OK	4.16	PPM	OK	C
14	MAY	10	14:31:48	3097E	3.19	PPM	OK	4.13	PPM	OK	C
14	MAY	10	14:32:13	3097F	3.19	PPM	OK	4.77	PPM	OK	C
14	MAY	10	14:32:44	3098	3.19	PPM	OK	5.33	PPM	OK	V
14	MAY	10	14:33:11	3098A	3.19	PPM	OK	4.66	PPM	OK	C
14	MAY	10	14:34:40	3099	3.19	PPM	OK	39.91	PPM	OK	V
14	MAY	10	14:35:38	3100	3.19	PPM	OK	14.83	PPM	OK	V
14	MAY	10	14:36:16	3100A	3.19	PPM	OK	13.12	PPM	OK	C

14	MAY	10	14:36:44	3100B	3.19	PPM	OK	11.22	PPM	OK	C
14	MAY	10	14:37:12	3103	3.19	PPM	OK	9.05	PPM	OK	V
14	MAY	10	14:37:41	3013A	3.19	PPM	OK	7.81	PPM	OK	C
14	MAY	10	14:38:11	3103B	3.19	PPM	OK	7.75	PPM	OK	C
14	MAY	10	14:39:28	3101	3.19	PPM	OK	7.68	PPM	OK	V
14	MAY	10	14:40:01	3101A	3.19	PPM	OK	7.43	PPM	OK	C
14	MAY	10	14:40:36	3101B	3.19	PPM	OK	8.75	PPM	OK	C
14	MAY	10	14:41:14	3101C	3.19	PPM	OK	10.2	PPM	OK	C
14	MAY	10	14:41:40	3102	3.19	PPM	OK	7.72	PPM	OK	V
14	MAY	10	14:42:06	3102A	3.19	PPM	OK	15.29	PPM	OK	C
14	MAY	10	14:42:44	3102B	3.19	PPM	OK	9.84	PPM	OK	C
14	MAY	10	14:44:14	2806	3.19	PPM	OK	5.72	PPM	OK	V
14	MAY	10	14:44:50	2806A	3.19	PPM	OK	4.93	PPM	OK	C
14	MAY	10	14:45:16	2806B	3.19	PPM	OK	4.92	PPM	OK	C
14	MAY	10	14:45:55	2806C	3.19	PPM	OK	5.18	PPM	OK	C
14	MAY	10	14:46:23	2806D	3.19	PPM	OK	6.17	PPM	OK	C
14	MAY	10	14:47:19	2806E	3.19	PPM	OK	6.65	PPM	OK	C
14	MAY	10	14:47:54	2806F	3.19	PPM	OK	5.07	PPM	OK	C
14	MAY	10	14:48:35	2806G	3.19	PPM	OK	4.64	PPM	OK	C
14	MAY	10	14:49:15	2806H	3.19	PPM	OK	4.67	PPM	OK	C
14	MAY	10	14:49:47	2806I	3.19	PPM	OK	4.99	PPM	OK	C
14	MAY	10	14:50:47	2084	3.19	PPM	OK	4.42	PPM	OK	V
14	MAY	10	14:51:29	2804A	3.19	PPM	OK	4.3	PPM	OK	C
14	MAY	10	14:52:14	2085	3.19	PPM	OK	4.5	PPM	OK	C
14	MAY	10	14:52:43	2805A	3.19	PPM	OK	4.89	PPM	OK	C
14	MAY	10	14:53:09	2805B	3.19	PPM	OK	5.01	PPM	OK	C
14	MAY	10	14:59:08	2802	3.19	PPM	OK	26.94	PPM	OK	V
14	MAY	10	14:59:37	2802A	3.19	PPM	OK	25.3	PPM	OK	C
14	MAY	10	15:00:07	2802B	3.19	PPM	OK	42.04	PPM	OK	C
14	MAY	10	15:07:30	2799	3.19	PPM	OK	85.59	PPM	OK	V
14	MAY	10	15:07:58	2799A	3.19	PPM	OK	65.61	PPM	OK	C
14	MAY	10	15:08:42	2800	3.19	PPM	OK	48.93	PPM	OK	C
14	MAY	10	15:09:20	2800A	3.19	PPM	OK	42.75	PPM	OK	C
14	MAY	10	15:09:56	2800B	3.19	PPM	OK	45.4	PPM	OK	C
14	MAY	10	15:11:38	2796	3.19	PPM	OK	21.23	PPM	OK	V
14	MAY	10	15:12:16	2796A	3.19	PPM	OK	17.45	PPM	OK	C
14	MAY	10	15:12:47	2796B	3.19	PPM	OK	16.85	PPM	OK	C
14	MAY	10	15:13:19	2796C	3.19	PPM	OK	17.07	PPM	OK	C
14	MAY	10	15:13:54	2797	3.19	PPM	OK	14.41	PPM	OK	V
14	MAY	10	15:14:24	2797A	3.19	PPM	OK	12.86	PPM	OK	C
14	MAY	10	15:14:54	2797B	3.19	PPM	OK	13.17	PPM	OK	C
14	MAY	10	15:15:30	2798	3.19	PPM	OK	14.8	PPM	OK	V
14	MAY	10	15:16:03	2798A	3.19	PPM	OK	11.48	PPM	OK	C
14	MAY	10	15:16:27	2798B	3.19	PPM	OK	11.7	PPM	OK	C
14	MAY	10	15:17:21	2795	3.19	PPM	OK	21.31	PPM	OK	V
14	MAY	10	15:17:45	2795A	3.19	PPM	OK	16.88	PPM	OK	C
14	MAY	10	15:18:08	2795B	3.19	PPM	OK	15.27	PPM	OK	C
14	MAY	10	15:18:41	2795C	3.19	PPM	OK	13	PPM	OK	C
14	MAY	10	15:19:12	2795D	3.19	PPM	OK	12.32	PPM	OK	C
14	MAY	10	15:20:13	2795E	3.19	PPM	OK	13.17	PPM	OK	C
14	MAY	10	15:21:55	2790	3.19	PPM	OK	18.99	PPM	OK	V
14	MAY	10	15:22:24	2790A	3.19	PPM	OK	50.06	PPM	OK	C
14	MAY	10	15:22:57	2790B	3.19	PPM	OK	30.08	PPM	OK	C
14	MAY	10	15:23:35	2791	3.19	PPM	OK	39.6	PPM	OK	V
14	MAY	10	15:24:10	2791A	3.19	PPM	OK	16.76	PPM	OK	C

14	MAY	10	15:24:42	2791B	3.19	PPM	OK	10.65	PPM	OK	C
14	MAY	10	15:25:51	2793	3.19	PPM	OK	37.25	PPM	OK	V
14	MAY	10	15:26:27	2794	3.19	PPM	OK	92.95	PPM	OK	V
14	MAY	10	15:27:57	2783	3.19	PPM	OK	11.07	PPM	OK	V
14	MAY	10	15:28:27	2783A	3.19	PPM	OK	12.02	PPM	OK	C
14	MAY	10	15:28:53	2783B	3.19	PPM	OK	9.5	PPM	OK	C
14	MAY	10	15:29:24	2783C	3.19	PPM	OK	9.48	PPM	OK	C
14	MAY	10	15:30:02	2783D	3.19	PPM	OK	7.97	PPM	OK	C
14	MAY	10	15:30:34	2783E	3.19	PPM	OK	7.37	PPM	OK	C
14	MAY	10	15:31:08	2783F	3.19	PPM	OK	7.12	PPM	OK	C
14	MAY	10	15:31:51	2783F	3.19	PPM	OK	7.56	PPM	OK	C
14	MAY	10	15:32:40	2784	3.19	PPM	OK	8.12	PPM	OK	V
14	MAY	10	15:33:08	2784A	3.19	PPM	OK	9.66	PPM	OK	C
14	MAY	10	15:33:34	2784B	3.19	PPM	OK	8.68	PPM	OK	C
14	MAY	10	15:34:14	2785	3.19	PPM	OK	7.87	PPM	OK	V
14	MAY	10	15:34:46	2785A	3.19	PPM	OK	7.81	PPM	OK	C
14	MAY	10	15:35:11	2785B	3.19	PPM	OK	7.17	PPM	OK	C
14	MAY	10	15:37:03	2787	3.19	PPM	OK	6.69	PPM	OK	V
14	MAY	10	15:37:43	2788	3.19	PPM	OK	7.04	PPM	OK	V
14	MAY	10	15:38:24	2788A	3.19	PPM	OK	7.57	PPM	OK	C
14	MAY	10	15:39:02	2788B	3.19	PPM	OK	7.91	PPM	OK	C
14	MAY	10	15:39:30	2788C	3.19	PPM	OK	6.81	PPM	OK	C
14	MAY	10	15:42:52	2558	3.19	PPM	OK	5.71	PPM	OK	V
14	MAY	10	15:43:26	2588A	3.19	PPM	OK	5.84	PPM	OK	C
14	MAY	10	15:44:01	2558B	3.19	PPM	OK	6.43	PPM	OK	C
14	MAY	10	15:44:31	2558C	3.19	PPM	OK	5.7	PPM	OK	C
14	MAY	10	15:44:58	2559	3.19	PPM	OK	5.84	PPM	OK	V
14	MAY	10	15:45:32	2559A	3.19	PPM	OK	6.38	PPM	OK	C
14	MAY	10	15:45:59	2559B	3.19	PPM	OK	6.37	PPM	OK	C
14	MAY	10	15:46:31	2564	3.19	PPM	OK	6.49	PPM	OK	V
14	MAY	10	15:47:03	2564A	3.19	PPM	OK	6.17	PPM	OK	C
14	MAY	10	15:47:33	2564B	3.19	PPM	OK	6.38	PPM	OK	C
14	MAY	10	15:48:04	2564C	3.19	PPM	OK	6.24	PPM	OK	C
14	MAY	10	15:48:38	2564D	3.19	PPM	OK	6.6	PPM	OK	C
14	MAY	10	15:49:08	2565	3.19	PPM	OK	6.53	PPM	OK	V
14	MAY	10	15:49:35	2565A	3.19	PPM	OK	6.33	PPM	OK	C
14	MAY	10	15:49:59	2565B	3.19	PPM	OK	6.28	PPM	OK	C
14	MAY	10	15:50:31	2568	3.19	PPM	OK	5.89	PPM	OK	V
14	MAY	10	15:50:59	2568A	3.19	PPM	OK	5.97	PPM	OK	C
14	MAY	10	15:51:28	2568B	3.19	PPM	OK	6.01	PPM	OK	C
14	MAY	10	15:51:58	2568C	3.19	PPM	OK	6.36	PPM	OK	C
14	MAY	10	15:52:49	2573	3.19	PPM	OK	6.65	PPM	OK	V
14	MAY	10	15:53:22	2573A	3.19	PPM	OK	6.74	PPM	OK	C
14	MAY	10	15:53:49	2573B	3.19	PPM	OK	7.29	PPM	OK	C
14	MAY	10	15:54:19	2573C	3.19	PPM	OK	5.79	PPM	OK	C
14	MAY	10	15:55:42	2578	3.19	PPM	OK	99.09	PPM	OK	V
14	MAY	10	15:57:39	2578A	3.19	PPM	OK	7.05	PPM	OK	C
14	MAY	10	15:58:25	2578B	3.19	PPM	OK	6.03	PPM	OK	C
14	MAY	10	15:59:00	2577	3.19	PPM	OK	5.75	PPM	OK	V
14	MAY	10	15:59:24	2577A	3.19	PPM	OK	5.91	PPM	OK	C
14	MAY	10	15:59:50	2577B	3.19	PPM	OK	6.44	PPM	OK	C
14	MAY	10	16:00:52	2576	3.19	PPM	OK	6.15	PPM	OK	V
14	MAY	10	16:01:25	2576A	3.19	PPM	OK	5.56	PPM	OK	C
14	MAY	10	16:01:52	2576B	3.19	PPM	OK	5.23	PPM	OK	C
14	MAY	10	16:02:24	2575	3.19	PPM	OK	6.42	PPM	OK	V

14	MAY	10	16:02:48	2575A	3.19	PPM	OK	5.63	PPM	OK	C
14	MAY	10	16:03:14	2575B	3.19	PPM	OK	5.56	PPM	OK	C
14	MAY	10	16:03:42	2616	3.19	PPM	OK	11.02	PPM	OK	V
14	MAY	10	16:04:22	2516B	3.19	PPM	OK	18.5	PPM	OK	C
14	MAY	10	16:04:59	2616B	3.19	PPM	OK	11.49	PPM	OK	C
14	MAY	10	16:05:37	2571	3.19	PPM	OK	5.54	PPM	OK	V
14	MAY	10	16:06:07	2571A	3.19	PPM	OK	5.17	PPM	OK	C
14	MAY	10	16:06:36	2571B	3.19	PPM	OK	5.27	PPM	OK	C
14	MAY	10	16:07:05	2572	3.19	PPM	OK	5.27	PPM	OK	V
14	MAY	10	16:07:33	2572A	3.19	PPM	OK	5.53	PPM	OK	C
14	MAY	10	16:08:02	2572B	3.19	PPM	OK	5.7	PPM	OK	C
14	MAY	10	16:08:34	2570	3.19	PPM	OK	5.17	PPM	OK	V
14	MAY	10	16:09:01	2570A	3.19	PPM	OK	5.15	PPM	OK	C
14	MAY	10	16:09:41	2570B	3.19	PPM	OK	5.27	PPM	OK	C
14	MAY	10	16:10:17	2566	3.19	PPM	OK	5.15	PPM	OK	V
14	MAY	10	16:10:53	2566A	3.19	PPM	OK	4.92	PPM	OK	C
14	MAY	10	16:11:24	2566B	3.19	PPM	OK	5.42	PPM	OK	C
14	MAY	10	16:12:03	2567	3.19	PPM	OK	5.44	PPM	OK	V
14	MAY	10	16:13:04	2567B	3.19	PPM	OK	4.8	PPM	OK	C
14	MAY	10	16:14:03	2563	3.19	PPM	OK	4.69	PPM	OK	C
14	MAY	10	16:14:28	2563A	3.19	PPM	OK	4.91	PPM	OK	C
14	MAY	10	16:14:52	2563B	3.19	PPM	OK	5.25	PPM	OK	C
14	MAY	10	16:15:16	2562	3.19	PPM	OK	4.47	PPM	OK	V
14	MAY	10	16:15:45	2562A	3.19	PPM	OK	4.44	PPM	OK	C
14	MAY	10	16:16:09	2562B	3.19	PPM	OK	5.21	PPM	OK	C
14	MAY	10	16:16:38	2561	3.19	PPM	OK	5.29	PPM	OK	V
14	MAY	10	16:17:10	2561A	3.19	PPM	OK	5.13	PPM	OK	C
14	MAY	10	16:17:34	2561B	3.19	PPM	OK	4.78	PPM	OK	C
14	MAY	10	16:18:01	2561C	3.19	PPM	OK	4.73	PPM	OK	C
14	MAY	10	16:18:48	2561D	3.19	PPM	OK	4.77	PPM	OK	C
14	MAY	10	16:19:42	2560	3.19	PPM	OK	4.35	PPM	OK	V
14	MAY	10	16:20:10	2560A	3.19	PPM	OK	4.09	PPM	OK	C
14	MAY	10	16:20:37	2560B	3.19	PPM	OK	4.84	PPM	OK	C
14	MAY	10	16:21:22	2612	3.19	PPM	OK	4.51	PPM	OK	V
14	MAY	10	16:21:50	2612A	3.19	PPM	OK	8.53	PPM	OK	C
14	MAY	10	16:22:22	2612B	3.19	PPM	OK	9.73	PPM	OK	C
14	MAY	10	16:22:58	2612C	3.19	PPM	OK	7.03	PPM	OK	C
14	MAY	10	16:23:33	2613	3.19	PPM	OK	5.55	PPM	OK	V
14	MAY	10	16:24:10	2613A	3.19	PPM	OK	8.14	PPM	OK	C
14	MAY	10	16:24:39	2613B	3.19	PPM	OK	7.09	PPM	OK	C
14	MAY	10	16:25:04	2613C	3.19	PPM	OK	6.26	PPM	OK	C
14	MAY	10	16:25:34	2613D	3.19	PPM	OK	5.94	PPM	OK	C
14	MAY	10	16:26:31	2614	3.19	PPM	OK	97.78	PPM	OK	V
14	MAY	10	16:26:59	2614A	3.19	PPM	OK	43.13	PPM	OK	C
14	MAY	10	16:27:37	2614B	3.19	PPM	OK	31.17	PPM	OK	C
14	MAY	10	16:28:05	2614C	3.19	PPM	OK	22.98	PPM	OK	C
14	MAY	10	16:28:35	2614D	3.19	PPM	OK	24.82	PPM	OK	C
14	MAY	10	16:29:30	2615	3.19	PPM	OK	18.2	PPM	OK	V
14	MAY	10	16:29:58	2615A	3.19	PPM	OK	39.29	PPM	OK	C
14	MAY	10	16:30:39	2615B	3.19	PPM	OK	32.4	PPM	OK	C
14	MAY	10	16:31:12	2615C	3.19	PPM	OK	27.38	PPM	OK	C
14	MAY	10	16:37:22	3855	3.19	PPM	OK	11.97	PPM	OK	V
14	MAY	10	16:37:53	3855A	3.19	PPM	OK	12.13	PPM	OK	C
14	MAY	10	16:38:27	3855B	3.19	PPM	OK	11.27	PPM	OK	C
14	MAY	10	16:38:57	3856	3.19	PPM	OK	15.93	PPM	OK	V

14	MAY	10	16:39:29	3856A	3.19	PPM	OK	10.59	PPM	OK	C
14	MAY	10	16:39:58	3856B	3.19	PPM	OK	11.19	PPM	OK	C
14	MAY	10	16:40:24	3857	3.19	PPM	OK	12.17	PPM	OK	V
14	MAY	10	16:40:50	3857A	3.19	PPM	OK	12.13	PPM	OK	C
14	MAY	10	16:41:22	3857B	3.19	PPM	OK	11.33	PPM	OK	C
14	MAY	10	16:43:34	3861	3.19	PPM	OK	8.94	PPM	OK	V
14	MAY	10	16:44:03	3861A	3.19	PPM	OK	6.82	PPM	OK	C
14	MAY	10	16:44:30	3861B	3.19	PPM	OK	6.19	PPM	OK	C
14	MAY	10	16:45:00	3862	3.19	PPM	OK	6.03	PPM	OK	V
14	MAY	10	16:45:26	3862A	3.19	PPM	OK	6.05	PPM	OK	C
14	MAY	10	16:45:53	3862B	3.19	PPM	OK	5.46	PPM	OK	C
14	MAY	10	16:47:32	3848	3.19	PPM	OK	5.7	PPM	OK	V
14	MAY	10	16:47:55	3848A	3.19	PPM	OK	6.53	PPM	OK	C
14	MAY	10	16:48:31	3848B	3.19	PPM	OK	6.76	PPM	OK	C
14	MAY	10	16:48:58	3849	3.19	PPM	OK	6.21	PPM	OK	V
14	MAY	10	16:49:29	3849A	3.19	PPM	OK	6.34	PPM	OK	C
14	MAY	10	16:49:58	3849B	3.19	PPM	OK	6.12	PPM	OK	C
14	MAY	10	16:50:47	3819	3.19	PPM	OK	5.65	PPM	OK	V
14	MAY	10	16:51:46	3819A	3.19	PPM	OK	5.43	PPM	OK	C
14	MAY	10	16:52:12	3819B	3.19	PPM	OK	5.08	PPM	OK	C
14	MAY	10	16:52:57	3845	3.19	PPM	OK	5.95	PPM	OK	V
14	MAY	10	16:53:19	3845A	3.19	PPM	OK	5.3	PPM	OK	C
14	MAY	10	16:54:06	3845B	3.19	PPM	OK	5.89	PPM	OK	C
14	MAY	10	16:54:33	3844	3.19	PPM	OK	6.7	PPM	OK	V
14	MAY	10	16:55:02	3844A	3.19	PPM	OK	6.26	PPM	OK	C
14	MAY	10	16:55:29	3845B	3.19	PPM	OK	6.06	PPM	OK	C
14	MAY	10	16:56:34	3841	3.19	PPM	OK	6.05	PPM	OK	V
14	MAY	10	16:57:02	3841A	3.19	PPM	OK	5	PPM	OK	C
14	MAY	10	16:57:29	3841B	3.19	PPM	OK	5.41	PPM	OK	C
14	MAY	10	16:58:12	3840	3.19	PPM	OK	5.27	PPM	OK	V
14	MAY	10	16:58:42	3840A	3.19	PPM	OK	5.29	PPM	OK	C
14	MAY	10	16:59:06	3840B	3.19	PPM	OK	5.13	PPM	OK	C
14	MAY	10	17:00:11	3839	3.19	PPM	OK	5.67	PPM	OK	V
14	MAY	10	17:00:36	3839A	3.19	PPM	OK	6.11	PPM	OK	C
14	MAY	10	17:01:00	3839B	3.19	PPM	OK	6.05	PPM	OK	C
14	MAY	10	17:01:32	3838	3.19	PPM	OK	5.95	PPM	OK	V
14	MAY	10	17:02:00	3838A	3.19	PPM	OK	6.01	PPM	OK	C
14	MAY	10	17:02:25	3838B	3.19	PPM	OK	6.15	PPM	OK	C
14	MAY	10	17:02:50	3837	3.19	PPM	OK	5.53	PPM	OK	V
14	MAY	10	17:03:16	3837A	3.19	PPM	OK	5.67	PPM	OK	C
14	MAY	10	17:03:54	3837B	3.19	PPM	OK	5.61	PPM	OK	C
14	MAY	10	17:04:31	3836	3.19	PPM	OK	5.27	PPM	OK	V
14	MAY	10	17:06:07	3836A	3.19	PPM	OK	5.29	PPM	OK	C
14	MAY	10	17:06:37	3836B	3.19	PPM	OK	5.11	PPM	OK	C
14	MAY	10	17:07:29	3804	3.19	PPM	OK	5.53	PPM	OK	V
14	MAY	10	17:08:17	3804A	3.19	PPM	OK	12.07	PPM	OK	C
14	MAY	10	17:08:56	3804B	3.19	PPM	OK	10.2	PPM	OK	C
14	MAY	10	17:09:32	3803	3.19	PPM	OK	9.46	PPM	OK	V
14	MAY	10	17:10:11	3803A	3.19	PPM	OK	8.57	PPM	OK	C
14	MAY	10	17:10:48	3803B	3.19	PPM	OK	8.34	PPM	OK	C
14	MAY	10	17:11:38	3800	3.19	PPM	OK	7.17	PPM	OK	V
14	MAY	10	17:12:23	3800A	3.19	PPM	OK	7.15	PPM	OK	C
14	MAY	10	17:12:54	3800B	3.19	PPM	OK	7.1	PPM	OK	C
14	MAY	10	17:13:25	3799	3.19	PPM	OK	6.86	PPM	OK	V
14	MAY	10	17:14:09	3799A	3.19	PPM	OK	7.12	PPM	OK	C

14	MAY	10	17:14:38	3799B	3.19	PPM	OK	7.41	PPM	OK	C
14	MAY	10	17:15:17	3798	3.19	PPM	OK	7.88	PPM	OK	V
14	MAY	10	17:15:53	3798A	3.19	PPM	OK	7.69	PPM	OK	C
14	MAY	10	17:16:39	3798B	3.19	PPM	OK	7.61	PPM	OK	C
14	MAY	10	17:17:16	3797	3.19	PPM	OK	7.62	PPM	OK	V
14	MAY	10	17:17:55	3797A	3.19	PPM	OK	7.12	PPM	OK	C
14	MAY	10	17:18:26	3797B	3.19	PPM	OK	6.94	PPM	OK	C
14	MAY	10	17:18:58	3796	3.19	PPM	OK	6.83	PPM	OK	V
14	MAY	10	17:19:37	3796A	3.19	PPM	OK	6.9	PPM	OK	C
14	MAY	10	17:20:48	3796B	3.19	PPM	OK	6.17	PPM	OK	C
14	MAY	10	17:21:24	3796C	3.19	PPM	OK	5.96	PPM	OK	C
14	MAY	10	17:22:14	3808	3.19	PPM	OK	5.99	PPM	OK	V
14	MAY	10	17:22:46	3808A	3.19	PPM	OK	5.29	PPM	OK	C
14	MAY	10	17:23:20	3808B	3.19	PPM	OK	5.67	PPM	OK	C
14	MAY	10	17:24:21	3807	3.19	PPM	OK	5.52	PPM	OK	V
14	MAY	10	17:24:53	3807A	3.19	PPM	OK	5.13	PPM	OK	C
14	MAY	10	17:25:21	3807B	3.19	PPM	OK	5.28	PPM	OK	C
14	MAY	10	17:26:07	3806	3.19	PPM	OK	5.46	PPM	OK	V
14	MAY	10	17:26:40	3806A	3.19	PPM	OK	5.62	PPM	OK	C
14	MAY	10	17:27:17	3806B	3.19	PPM	OK	5.64	PPM	OK	C
14	MAY	10	17:28:39	3805A	3.19	PPM	OK	4.59	PPM	OK	C
14	MAY	10	17:29:55	3794A	3.19	PPM	OK	5.22	PPM	OK	C
14	MAY	10	17:31:46	3816	3.19	PPM	OK	6.24	PPM	OK	V
14	MAY	10	17:32:31	3815	3.19	PPM	OK	5.87	PPM	OK	V
14	MAY	10	17:33:34	3815A	3.19	PPM	OK	5.79	PPM	OK	C
14	MAY	10	17:34:07	3815B	3.19	PPM	OK	5.65	PPM	OK	C
14	MAY	10	17:34:38	3815C	3.19	PPM	OK	5.25	PPM	OK	C
14	MAY	10	17:35:35	3853	3.19	PPM	OK	6.58	PPM	OK	V
14	MAY	10	17:36:11	3815A	3.19	PPM	OK	5.65	PPM	OK	C
14	MAY	10	17:36:42	3853B	3.19	PPM	OK	6.13	PPM	OK	C
14	MAY	10	17:37:14	3853C	3.19	PPM	OK	5.83	PPM	OK	C
14	MAY	10	17:37:55	3817	3.19	PPM	OK	5.31	PPM	OK	V
14	MAY	10	17:38:27	3817A	3.19	PPM	OK	5.46	PPM	OK	C
14	MAY	10	17:38:58	3817B	3.19	PPM	OK	5.17	PPM	OK	C
14	MAY	10	17:44:01	2823	3.19	PPM	OK	5.81	PPM	OK	V
14	MAY	10	17:44:52	2823A	3.19	PPM	OK	5.07	PPM	OK	C
14	MAY	10	17:45:27	2823B	3.19	PPM	OK	4.84	PPM	OK	C
14	MAY	10	17:46:01	2821	3.19	PPM	OK	4.96	PPM	OK	V
14	MAY	10	17:46:39	2821A	3.19	PPM	OK	5.07	PPM	OK	C
14	MAY	10	17:47:06	2821B	3.19	PPM	OK	4.47	PPM	OK	C
14	MAY	10	17:47:50	2819	3.19	PPM	OK	10.68	PPM	OK	V
14	MAY	10	17:48:21	2819A	3.19	PPM	OK	10.19	PPM	OK	C
14	MAY	10	17:49:03	2819B	3.19	PPM	OK	10.03	PPM	OK	C
14	MAY	10	17:49:37	2830	3.19	PPM	OK	9.15	PPM	OK	V
14	MAY	10	17:50:10	2820A	3.19	PPM	OK	8.07	PPM	OK	C
14	MAY	10	17:50:57	2820B	3.19	PPM	OK	7.22	PPM	OK	C
14	MAY	10	17:51:49	2832	3.19	PPM	OK	7.52	PPM	OK	V
14	MAY	10	17:52:46	2833	3.19	PPM	OK	7.63	PPM	OK	V
14	MAY	10	17:53:20	2828	3.19	PPM	OK	6.51	PPM	OK	V
14	MAY	10	17:53:48	2828A	3.19	PPM	OK	6.2	PPM	OK	C
14	MAY	10	17:54:23	2828B	3.19	PPM	OK	6.69	PPM	OK	C
Logged by Hand Only											
14	MAY	10		2801	3.19			5000	PPM		V

APPENDIX D  
TO BYPASS INCIDENT REPORTS

Date	Start Time	Stop Time	Duration (min.)	Reason	Corrective Action	Corrective Action Completion Date
12/9/2009	12:59	13:00	0:01	Power Outage	N/A	N/A
12/26/2009	23:13	23:14	0:01	403 column flooding due to catalyst build-up in bottom of column causing pump to fail	Clean out 403, Add output alarm, investigate further actions	1/16/2010, 4/16/2010, Ongoing
1/8/2010	5:20	5:23	0:03	Low excess O2 due to introduction of feed in reactor A using inconsistenat procedures found in the units SOPs	Update procedure.	1/12/2010
1/8/2010	9:33	9:36	0:03	Low excess O2 due to introduction of feed in reactor A using inconsistenat procedures found in the units SOPs	Update procedure.	1/12/2010
1/8/2010	9:45	9:48	0:03	Operator was following an inconsistant procedure found in the SOP	Update procedure, add interlock to feed valves.	1/12/2010, 07/18/2010
1/12/2010	15:07	15:10	0:03	403 column flooding due to reduced air flow to decrease the presuure in the reactors	Clean out 403, Add output alarm, investigate further actions	1/16/2010, 4/16/2010, Ongoing
1/17/2010	11:33	11:34	0:01	The thermal couples were found charred upon removal from the thermal oxidizer and determined that they were not rated for high temperature use	Update spare parts list	1/22/2010
1/17/2010	19:04	19:06	0:02	Upset in the 70K boiler led to plant wide steam failure.	N/A	N/A
1/25/2010	18:56	19:00	0:04	Low plant air pressure.	Remove plant air interlock.	Ongoing.
1/25/2010	20:50	20:52	0:02	Low plant air pressure.	Remove plant air interlock.	Ongoing.
1/27/2010	5:17	5:32	0:15	Low natural gas pressure due to a boiler upset	New gas line.	Ongoing.
1/27/2010	5:35	5:39	0:04	Boiler upsets caused a plant wide steam failure.	N/A	N/A

Date	Start Time	Stop Time	Duration (min.)	Reason	Corrective Action	Corrective Action Completion Date
2/17/2010	11:53	11:58	0:05	403 column flooding due to catalyst build-up in bottom of column causing pump to fail	Clean out 403, Add output alarm, investigate further actions	3/11/2010, 4/16/2010, Ongoing
2/17/2010	12:27	12:30	0:03	A procedural error was found in the SOP that lead to low O2 in the system causing the high chamber temperature.	Update start up procedure.	4/18/2010
2/17/2010	13:40	13:41	0:01	A procedural error was found in the SOP that lead to low O2 in the system causing the high chamber temperature.	Update start up procedure.	4/18/2010
2/27/2010	20:19	20:22	0:03	Low plant air pressure due to higher demand in other units	Remove plant air interlock.	Ongoing.
3/12/2010	0:38	0:41	0:03	Low excess O2 due to plugging in the overhead line of the 404 column	Replace 401 bottoms pump. Better 403 cleaning schedule.	5/10/2010
3/31/2010	22:26	22:28	0:02	Power Outage	N/A	N/A
3/31/2010	23:38	23:40	0:02	Insufficient O2 due to the power outage lead to a high chamber temperature.	Add runsheet for base plant. Modify start up code on thermal oxidizer.	05/01/2010. Ongoing
4/9/2010	9:14	9:16	0:02	Low excess O2 due to plugging in the overhead line of the 404 column	Clean the 404 column packing.	4/12/2010
5/5/2010	21:34	21:37	0:03	High stack temperature caused by loss of cooling to the 403 column which was due faulty wiring in a pump	Repair wiring to 401 bottoms pump.	5/8/2010
6/14/2010	10:06	10:10	0:04	Low plant air pressure due to orifice plate missing in air line	Add orifice to purge lines.	7/16/2010
6/15/2010	6:39	6:42	0:03	High high level in knock out pot due to elevated temperatures and flooding in the 403 column causing circulation to stop in the ammonia recovery columns	Clean the 403 column.	7/23/2010

Date	Start Time	Stop Time	Duration (min.)	Reason	Corrective Action	Corrective Action Completion Date
6/18/2010	23:12	23:14	0:02	High stack temperature due to a plugged pressure transmitter on the 404 column.	Insulate the 404 top pressure trasmitter.	Ongoing.
6/27/2010	20:02	20:04	0:02	Power Outage	N/A	N/A
6/27/2010	20:05	20:12	0:07	Operator error.	Incorporate interlocks into the process so that feed cannot be introduced into the reactors while the bypass valve is open	7/13/2010

## BYPASS INCIDENT REPORT

Plant 41

This report form applies to the following areas:  
Cyano Reactors and Ammonia Recovery System

Complete this form immediately following any bypass of the Thermal Oxidizer.

### 1) Bypass Period

Bypass began: Date: 12/9/2009 Time: 12:59

Bypass ended: Date: 12/9/2009 Time: 13:00

Bypass duration: Hours: Minutes: 1

2) Estimated HAPs emissions: Acetonitrile = 0.06 pounds, Benzene = 0.04 pounds, Xylenes = 0.0001 pounds, Hydrogen Cyanide = 0.06 pounds

3) What was the general cause of the bypass incident? Power outage

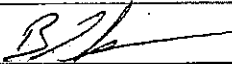
### 4) What type of bypass occurred? (Check all that apply.)

Instrument nitrogen less than 60 psi  
Instrument air less than 60 psi  
Stack temperature less than 700°C  
Chamber temperature greater than 1038°C  
Stack temperature greater than 982°C  
☒ Loss of electrical power  
Other utility disruption [Describe below]  
Fire eye lost sight of flame  
Plant start-up

Plant shutdown  
PHD data lost  
Erratic Thermal Oxidizer temperature  
Operator error  
Mechanical failure  
Process upset  
Instrument/control parameters  
Other [Describe below]

5) What plant area or major equipment was affected (be specific)? The whole site lost power due to a short in the main switch gear to the facility.

6) What is the root cause(s) of the bypass incident? High winds blowing the power lines and causing a short in the system.

<b>7) How did you determine the root cause(s) of the bypass incident?</b> Loss of electrical power to the site.		
<b>8) What corrective action(s) has been or will be taken to address the root cause(s) of the bypass incident?</b> None at his time.		
<b>9) Who is responsible for completing the corrective action(s)?</b>		
<b>10) What actions were taken to end the bypass incident and restore normal operation?</b> Power was restored to the facility and operations were checked before the unit was started up.		
<b>11) Was the Start-up, Shutdown, Malfunction Plan (SSMP) followed?</b> <span style="float: right;"><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No*</span> *If not, provide explanation:		
<b>12) If the SSMP was not followed, was IDEM notified?</b> <span style="float: right;"><input type="checkbox"/> Yes <input type="checkbox"/> No</span>		
<b>13) Are revisions to the SSMP needed to better address future bypass incidents?</b> <span style="float: right;"><input type="checkbox"/> Yes <input type="checkbox"/> No</span> If so, provide recommendations:		
<b>Name:</b> Ben Spurr	<b>Signature:</b> 	<b>Date:</b> 12/30/09

**BYPASS INCIDENT REPORT**

Plant 41

This report form applies to the following areas:  
Cyano Reactors and Ammonia Recovery System

**Complete this form immediately following any bypass of the Thermal Oxidizer.****1) Bypass Period****Bypass began:** Date: 12/26/2009 Time: 23:13**Bypass ended:** Date: 12/26/2009 Time: 23:14**Bypass duration:** Hours: Minutes: 1**2) Estimated HAPs emissions:** Acetonitrile-0.12 pounds, Benzene-0.07 pounds, Xylene-0.0002 pounds, Hydrogen Cyanide-0.11 pounds**3) What was the general cause of the bypass incident?**

This bypass incident was caused by the 403 column flooding out, leading to a high reactor top pressure. This pressure (> 8.0 psig) caused the reactors to shut-down by interlocking the feed lines closed. Once the feed and airflow were lost, the thermal oxidizer shut down.

**4) What type of bypass occurred? (Check all that apply.)**

- |  |   |
|--|---|
| <input type="checkbox"/> Instrument nitrogen less than 60 psi      | <input checked="" type="checkbox"/> Plant shutdown            |
| <input type="checkbox"/> Instrument air less than 60 psi           | <input type="checkbox"/> PHD data lost                        |
| <input type="checkbox"/> Stack temperature less than 700°C         | <input type="checkbox"/> Erratic Thermal Oxidizer temperature |
| <input type="checkbox"/> Chamber temperature greater than 1038°C   | <input type="checkbox"/> Operator error                       |
| <input type="checkbox"/> Stack temperature greater than 982°C      | <input type="checkbox"/> Mechanical failure                   |
| <input type="checkbox"/> Loss of electrical power                  | <input type="checkbox"/> Process upset                        |
| <input type="checkbox"/> Other utility disruption [Describe below] | <input type="checkbox"/> Instrument/control parameters        |
| <input type="checkbox"/> Fire eye lost sight of flame              | <input type="checkbox"/> Other [Describe below]               |
| <input type="checkbox"/> Plant start-up                            |   |

**5) What plant area or major equipment was affected (be specific)?**

403 column, reactor A, reactor B and the thermal oxidizer.

**6) What is the root cause(s) of the bypass incident?**

Solids build up in the 403 bottoms caused the bottoms flow to stop, leading to the flooding issue. The root cause of the solids build up is catalyst from the reactors. This catalyst is carried out through the primary cooler, continues to the LDU and is sent back to the ammonia recovery system in the raffinate.

**7) How did you determine the root cause(s) of the bypass incident?**

The root cause was identified based on trending data, interview with operations staff and using historical knowledge of the process.

**8) What corrective action(s) has been or will be taken to address the root cause(s) of the bypass incident?**

Operations steamed out the 403 bottoms line to clear the line of solids. The 403 bottoms is on the maintenance schedule to be cleaned out during the next shut down. A valve output alarm is being installed on the 403 level controller to notify operations earlier to help prevent these failures. Additional countermeasures are being considered for preventing catalyst from being circulated through the ammonia recovery system.

**9) Who is responsible for completing the corrective action(s)?**

Plant 41 Unit Process Engineer.

**10) What actions were taken to end the bypass incident and restore normal operation?**

When the top pressure reached >8.0 psig, the reactor feeds (organics and ammonia) were interlocked closed.

**11) Was the Start-up, Shutdown, Malfunction Plan (SSMP) followed?**

☒ Yes

☐ No\*

\*If not, provide explanation:

**12) If the SSMP was not followed, was IDEM notified?**

N/A

☐ Yes

☐ No

**13) Are revisions to the SSMP needed to better address future bypass incidents?**

☐ Yes

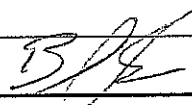
☒ No

If so, provide recommendations: We are investigating to determine if the procedures need revised.

Name:

Ben Stewart

Signature:



Date:

2/8/2010

## BYPASS INCIDENT REPORT

Plant 41

This report form applies to the following areas:  
Cyano Reactors and Ammonia Recovery System

Complete this form immediately following any bypass of the Thermal Oxidizer.

### 1) Bypass Period

Bypass began: Date: 1/8/2010 Time: 05:20

Bypass ended: Date: 1/8/2010 Time: 05:23

Bypass duration: Hours:0 Minutes: 3

2) Estimated HAPs emissions: Acetonitrile – 0.18 lbs., Benzene – 0.10 lbs., Xylenes – 0.0004 lbs., Hydrogen Cyanide – 0.17 lbs.

### 3) What was the general cause of the bypass incident?

The stack exhaust O2 reading fell below the lower interlock causing the thermal oxidizer to shut down.

### 4) What type of bypass occurred? (Check all that apply.)

- |   |   |
|---|---|
| <ul style="list-style-type: none"><li><input type="checkbox"/> Instrument nitrogen less than 60 psi</li><li><input type="checkbox"/> Instrument air less than 60 psi</li><li><input type="checkbox"/> Stack temperature less than 700°C</li><li><input type="checkbox"/> Chamber temperature greater than 1038°C</li><li><input type="checkbox"/> Stack temperature greater than 982°C</li><li><input type="checkbox"/> Loss of electrical power</li><li><input type="checkbox"/> Other utility disruption [Describe below]</li><li><input type="checkbox"/> Fire eye lost sight of flame</li><li><input type="checkbox"/> Plant start-up</li></ul> | <ul style="list-style-type: none"><li><input type="checkbox"/> Plant shutdown</li><li><input type="checkbox"/> PHD data lost</li><li><input type="checkbox"/> Erratic Thermal Oxidizer temperature</li><li><input type="checkbox"/> Operator error</li><li><input type="checkbox"/> Mechanical failure</li><li><input type="checkbox"/> Process upset</li><li><input checked="" type="checkbox"/> Instrument/control parameters</li><li><input type="checkbox"/> Other [Describe below]</li></ul> |
|---|---|

### 5) What plant area or major equipment was affected (be specific)?

Thermal oxidizer.

### 6) What is the root cause(s) of the bypass incident?

Reactor B was running and reactor A had just had organic feed and ammonia introduced. The sudden change in waste gas composition caused the O2 to drop off while the blower at the thermal oxidizer could not react fast enough before the stack O2 fell below the 0.2% interlock.

7) How did you determine the root cause(s) of the bypass incident?

Process trend analysis.

8) What corrective action(s) has been or will be taken to address the root cause(s) of the bypass incident?

The introduction of feed into Reactor A caused a sudden change in the waste gas composition causing the oxygen levels to drop off. Upon review of the start-up procedures, inconsistencies were found in the procedures that lead to the sudden change in the waste gas composition. The procedures are being reviewed to remove the inconsistencies and a run sheet is being developed that contains the start-up and shutdown procedures.

9) Who is responsible for completing the corrective action(s)?

Unit process coordinator and unit process engineer.

10) What actions were taken to end the bypass incident and restore normal operation? Feed was removed from both reactors once the thermal oxidizer failed. The thermal oxidizer was restarted and the temperature set points were achieved. Feed was then introduced into the reactors.

11) Was the Start-up, Shutdown, Malfunction Plan (SSMP) followed? ☒ Yes ☐ No\*

\*If not, provide explanation:

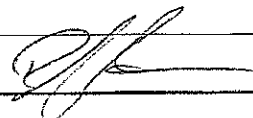
12) If the SSMP was not followed, was IDEM notified? ☐ Yes ☐ No

13) Are revisions to the SSMP needed to better address future bypass incidents? ☐ Yes ☒ No

If so, provide recommendations:

Name: Ben Harris

Signature:



Date: 2/22/2010

## BYPASS INCIDENT REPORT

Plant 41

This report form applies to the following areas:  
Cyano Reactors and Ammonia Recovery System

Complete this form immediately following any bypass of the Thermal Oxidizer.

### 1) Bypass Period

Bypass began:

Date: 1/8/2010

Time: 09:33

Bypass ended:

Date: 1/8/2010

Time: 09:36

Bypass duration:

Hours: 0

Minutes: 3

2) Estimated HAPs emissions: Acetonitrile – 0.13 lbs., Benzene – 0.07 lbs., Xylenes – 0.0004 lbs., Hydrogen Cyanide – 0.12 lbs.

### 3) What was the general cause of the bypass incident?

The stack exhaust O2 reading fell below the lower interlock causing the thermal oxidizer to shut down.

### 4) What type of bypass occurred? (Check all that apply.)

- ☐ Instrument nitrogen less than 60 psi
- ☐ Instrument air less than 60 psi
- ☐ Stack temperature less than 700°C
- ☐ Chamber temperature greater than 1038°C
- ☐ Stack temperature greater than 982°C
- ☐ Loss of electrical power
- ☐ Other utility disruption [Describe below]
- ☐ Fire eye lost sight of flame
- ☐ Plant start-up

- ☐ Plant shutdown
- ☐ PHD data lost
- ☐ Erratic Thermal Oxidizer temperature
- ☐ Operator error
- ☐ Mechanical failure
- ☐ Process upset
- ☒ Instrument/control parameters
- ☐ Other [Describe below]

### 5) What plant area or major equipment was affected (be specific)?

Thermal oxidizer.

### 6) What is the root cause(s) of the bypass incident?

Reactor A was running and reactor B had just had organic feed and ammonia introduced. The sudden change in waste gas composition caused the O2 to drop off while the blower at the thermal oxidizer could not react fast enough before the stack O2 fell below the 0.2% interlock.

7) How did you determine the root cause(s) of the bypass incident?

Process trend analysis.

8) What corrective action(s) has been or will be taken to address the root cause(s) of the bypass incident?

The introduction of feed into Reactor B caused a sudden change in the waste gas composition causing the oxygen levels to drop off. Upon review of the start-up procedures, inconsistencies were found in the procedures that lead to the sudden change in the waste gas composition. The procedures are being reviewed to remove the inconsistencies and a run sheet is being developed that contains the start-up and shutdown procedures.

9) Who is responsible for completing the corrective action(s)?

Unit process coordinator and unit process engineer.

10) What actions were taken to end the bypass incident and restore normal operation? Feed was removed from both reactors once the thermal oxidizer failed. The thermal oxidizer was restarted and the temperature set points were achieved. Feed was then introduced into the reactors.

11) Was the Start-up, Shutdown, Malfunction Plan (SSMP) followed?

☒ Yes

☐ No\*

\*If not, provide explanation:

12) If the SSMP was not followed, was IDEM notified?

☐ Yes

☐ No

13) Are revisions to the SSMP needed to better address future bypass incidents?

☐ Yes

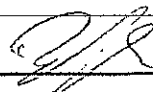
☒ No

If so, provide recommendations:

Name:

Ben Spina

Signature:



Date:

2/22/2010

## BYPASS INCIDENT REPORT

Plant 41

This report form applies to the following areas:  
Cyano Reactors and Ammonia Recovery System

Complete this form immediately following any bypass of the Thermal Oxidizer.

### 1) Bypass Period

Bypass began: Date: 1/8/2010 Time: 09:45

Bypass ended: Date: 1/8/2010 Time: 09:49

Bypass duration: Hours: 0 Minutes: 3

2) Estimated HAPs emissions: Acetonitrile – 0.06 lbs., Benzene – 0.04 lbs., Xylenes – 0.0001 lbs., Hydrogen Cyanide – 0.06 lbs.

### 3) What was the general cause of the bypass incident?

Reactor feed was introduced to Rx A while the thermal oxidizer was already bypassed prior to the stack temperature reaching the interlock that will allow for the waste gas valve to be opened.

### 4) What type of bypass occurred? (Check all that apply.)

- |   |   |
|---|---|
| <ul style="list-style-type: none"><li><input type="checkbox"/> Instrument nitrogen less than 60 psi</li><li><input type="checkbox"/> Instrument air less than 60 psi</li><li><input type="checkbox"/> Stack temperature less than 700°C</li><li><input type="checkbox"/> Chamber temperature greater than 1038°C</li><li><input type="checkbox"/> Stack temperature greater than 982°C</li><li><input type="checkbox"/> Loss of electrical power</li><li><input type="checkbox"/> Other utility disruption [Describe below]</li><li><input type="checkbox"/> Fire eye lost sight of flame</li><li><input type="checkbox"/> Plant start-up</li></ul> | <ul style="list-style-type: none"><li><input type="checkbox"/> Plant shutdown</li><li><input type="checkbox"/> PHD data lost</li><li><input type="checkbox"/> Erratic Thermal Oxidizer temperature</li><li><input checked="" type="checkbox"/> Operator error</li><li><input type="checkbox"/> Mechanical failure</li><li><input type="checkbox"/> Process upset</li><li><input type="checkbox"/> Instrument/control parameters</li><li><input type="checkbox"/> Other [Describe below]</li></ul> |
|---|---|

### 5) What plant area or major equipment was affected (be specific)?

Thermal oxidizer.

### 6) What is the root cause(s) of the bypass incident?

The operator introduced feed prior to the waste gas valve being opened. The operator was following the wrong procedure during this bypass event.

7) How did you determine the root cause(s) of the bypass incident?

Process trend analysis.

8) What corrective action(s) has been or will be taken to address the root cause(s) of the bypass incident?

A discussion was held with the operators in regards to the bypass event. It was stressed that feed cannot be introduced into the reactors while the bypass vent is open. A follow-up e-mail communication was distributed to all Plant 41 operators detailing the procedures to follow during a bypass. The procedures are being modified to state that feed cannot be introduced into the reactors while the bypass vent is open. Modifications are also being considered to interlock the reactor feed to the bypass vent so that if the vent is open feed cannot be introduced into the reactors.

9) Who is responsible for completing the corrective action(s)?

Unit process engineer.

10) What actions were taken to end the bypass incident and restore normal operation? The stack temperature reached the appropriate valve to close the bypass valve and waste gas was directed to the thermal oxidizer to end the bypass.

11) Was the Start-up, Shutdown, Malfunction Plan (SSMP) followed?

☒ Yes

☐ No\*

\*If not, provide explanation:

12) If the SSMP was not followed, was IDEM notified?

☐ Yes

☐ No

13) Are revisions to the SSMP needed to better address future bypass incidents?

☐ Yes

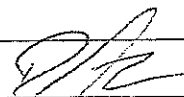
☒ No

If so, provide recommendations:

Name:

Ben Smith

Signature:



Date:

2/22/2010

## BYPASS INCIDENT REPORT

Plant 41

This report form applies to the following areas:  
Cyano Reactors and Ammonia Recovery System

Complete this form immediately following any bypass of the Thermal Oxidizer.

### 1) Bypass Period

**Bypass began:**

Date: 1/17/2010

Time: 11:33

**Bypass ended:**

Date: 1/17/2010

Time: 11:35

**Bypass duration:**

Hours: 0

Minutes: 2

**2) Estimated HAPs emissions:** Acetonitrile – 0.18 lbs., Benzene – 0.10 lbs., Xylenes – 0.0004 lbs., Hydrogen Cyanide – 0.17 lbs.

### 3) What was the general cause of the bypass incident?

During troubleshooting of the stack temperature reading, the T.O. was inadvertently tripped on low stack temperature when the control mechanic removed a thermocouple for inspection.

### 4) What type of bypass occurred? (Check all that apply.)

- ☐ Instrument nitrogen less than 60 psi
- ☐ Instrument air less than 60 psi
- ☒ Stack temperature less than 700°C
- ☐ Chamber temperature greater than 1038°C
- ☐ Stack temperature greater than 982°C
- ☐ Loss of electrical power
- ☐ Other utility disruption [Describe below]
- ☐ Fire eye lost sight of flame
- ☐ Plant start-up

- ☐ Plant shutdown
- ☐ PHD data lost
- ☐ Erratic Thermal Oxidizer temperature
- ☐ Operator error
- ☒ Mechanical failure
- ☐ Process upset
- ☐ Instrument/control parameters
- ☐ Other [Describe below]

### 5) What plant area or major equipment was affected (be specific)?

Thermal oxidizer.

### 6) What is the root cause(s) of the bypass incident?

A thermal oxidizer stack thermocouple was removed for inspection while the unit was performing poorly. This caused a low temperature interlock due to the thermocouple reading ambient air temperature.

**7) How did you determine the root cause(s) of the bypass incident?**

Control mechanic found the thermocouples installed in the stack to be charred. After that bypass incident, it was discovered that the thermocouples that were installed were not rated appropriately.

**8) What corrective action(s) has been or will be taken to address the root cause(s) of the bypass incident?**

The issue with pulling the thermocouples out during equipment uptime was directly addressed with the control mechanic. Appropriate spare parts have been designated for the stack thermocouples.

**9) Who is responsible for completing the corrective action(s)?**

Instrument technician.

**10) What actions were taken to end the bypass incident and restore normal operation?**

Feed was removed from both reactors once the thermal oxidizer failed. The thermocouples were replaced. The thermal oxidizer was restarted and after temperature set points were achieved, feed was re-introduced back into the reactors.

**11) Was the Start-up, Shutdown, Malfunction Plan (SSMP) followed?**

☒ Yes

☐ No\*

\*If not, provide explanation:

**12) If the SSMP was not followed, was IDEM notified?**

N/A

☐ Yes

☐ No

**13) Are revisions to the SSMP needed to better address future bypass incidents?**

☐ Yes

☒ No

If so, provide recommendations:

Name:

Ben Stevens

Signature:



Date:

2/23/16

## BYPASS INCIDENT REPORT

Plant 41

This report form applies to the following areas:  
Cyano Reactors and Ammonia Recovery System

Complete this form immediately following any bypass of the Thermal Oxidizer.

### 1) Bypass Period

**Bypass began:**

Date: 1/25/2010

Time: 18:56

**Bypass ended:**

Date: 1/25/2010

Time: 19:00

**Bypass duration:**

Hours: 0

Minutes: 4

**2) Estimated HAPs emissions:** Acetonitrile – 0.23 lbs., Benzene – 0.13 lbs., Xylenes – 0.0005 lbs., Hydrogen Cyanide – 0.22 lbs.

### 3) What was the general cause of the bypass incident?

The supply pressure of the plant air for the thermal oxidizer went low causing a thermal oxidizer shutdown.

### 4) What type of bypass occurred? (Check all that apply.)

- ☐ Instrument nitrogen less than 60 psi
- ☒ Instrument air less than 60 psi
- ☐ Stack temperature less than 700°C
- ☐ Chamber temperature greater than 1038°C
- ☐ Stack temperature greater than 982°C
- ☐ Loss of electrical power
- ☐ Other utility disruption [Describe below]
- ☐ Fire eye lost sight of flame
- ☐ Plant start-up

- ☐ Plant shutdown
- ☐ PHD data lost
- ☐ Erratic Thermal Oxidizer temperature
- ☐ Operator error
- ☐ Mechanical failure
- ☐ Process upset
- ☐ Instrument/control parameters
- ☐ Other [Describe below]

### 5) What plant area or major equipment was affected (be specific)?

Thermal oxidizer.

### 6) What is the root cause(s) of the bypass incident?

The alarm screen on the PLC at the thermal oxidizer only showed the "watch dog timer" failure. This alarm is designed to indicate when a control board within the PLC is not functioning. Currently, every first out failure causes a watch dog timer failure and on occasions, the first out alarm is not displayed. During this outage, all process trends were reviewed and no process upset could be identified. The gas pressure to the boiler house was trended with no drops noticed or

any excess usage identified. The only thermal oxidizer failure mode that cannot be trended is the plant air pressure to the unit.

**7) How did you determine the root cause(s) of the bypass incident?**

See item #6.

**8) What corrective action(s) has been or will be taken to address the root cause(s) of the bypass incident?**

As part of the corrective actions around thermal oxidizer bypass incidents, the control logic around the thermal oxidizer is being investigated to correct the watch dog timer. An MOC has been written to bring the plant air pressure reading back to the DCS and install a low pressure alarm to provide response time in the event that this failure happens again. Additionally, the MOC is currently drafted to remove the low plant air interlock due to redundant systems. Without plant air, all process and gas valves would fail closed, causing a shutdown.

**9) Who is responsible for completing the corrective action(s)?**

Unit process engineer for plant 41.

**10) What actions were taken to end the bypass incident and restore normal operation?**

Feed was removed from both reactors once the thermal oxidizer failed. The thermal oxidizer was restarted and after temperature set points were achieved, feed was re-introduced back into the reactors.

**11) Was the Start-up, Shutdown, Malfunction Plan (SSMP) followed?** ☒ Yes ☐ No\*

\*If not, provide explanation:

**12) If the SSMP was not followed, was IDEM notified?** N/A ☐ Yes ☐ No

## BYPASS INCIDENT REPORT

Plant 41

This report form applies to the following areas:  
Cyano Reactors and Ammonia Recovery System

Complete this form immediately following any bypass of the Thermal Oxidizer:

### 1) Bypass Period

Bypass began: Date: 1/25/2010 Time: 20:50

Bypass ended: Date: 1/25/2010 Time: 20:52

Bypass duration: Hours: 0 Minutes: 2

2) Estimated HAPs emissions: Acetonitrile – 0.06 lbs., Benzene – 0.03 lbs., Xylenes – 0.0001 lbs., Hydrogen Cyanide – 0.06 lbs.

### 3) What was the general cause of the bypass incident?

The supply pressure of the plant air for the thermal oxidizer went low causing a thermal oxidizer shutdown.

### 4) What type of bypass occurred? (Check all that apply.)

- |   |   |
|---|---|
| <input type="checkbox"/> Instrument nitrogen less than 60 psi       | <input type="checkbox"/> Plant shutdown                       |
| <input checked="" type="checkbox"/> Instrument air less than 60 psi | <input type="checkbox"/> PHD data lost                        |
| <input type="checkbox"/> Stack temperature less than 700°C          | <input type="checkbox"/> Erratic Thermal Oxidizer temperature |
| <input type="checkbox"/> Chamber temperature greater than 1038°C    | <input type="checkbox"/> Operator error                       |
| <input type="checkbox"/> Stack temperature greater than 982°C       | <input type="checkbox"/> Mechanical failure                   |
| <input type="checkbox"/> Loss of electrical power                   | <input type="checkbox"/> Process upset                        |
| <input type="checkbox"/> Other utility disruption [Describe below]  | <input type="checkbox"/> Instrument/control parameters        |
| <input type="checkbox"/> Fire eye lost sight of flame               | <input type="checkbox"/> Other [Describe below]               |
| <input type="checkbox"/> Plant start-up                             |   |

### 5) What plant area or major equipment was affected (be specific)?

Thermal oxidizer.

### 6) What is the root cause(s) of the bypass incident?

The alarm screen on the PLC at the thermal oxidizer only showed the "watch dog timer" failure. This alarm is designed to indicate when a control board within the PLC is not functioning. Currently, every first out failure causes a watch dog timer failure and on occasions, the first out alarm is not displayed. During this outage, all process trends were reviewed and no process upset could be identified. The gas pressure to the boiler house was trended with no drops noticed or

any excess usage identified. The only thermal oxidizer failure mode that cannot be trended is the plant air pressure to the unit. This failure happened earlier on the shift and was the second of two bypasses having the same root cause.

**7) How did you determine the root cause(s) of the bypass incident?**

See item #6.

**8) What corrective action(s) has been or will be taken to address the root cause(s) of the bypass incident?**

As part of the corrective actions around thermal oxidizer bypass incidents, the control logic around the thermal oxidizer is being investigated to correct the watch dog timer. An MOC has been written to bring the plant air pressure reading back to the DCS and install a low pressure alarm to provide response time in the event that this failure happens again. Additionally, the MOC is currently drafted to remove the low plant air interlock due to redundant systems. Without plant air, all process and gas valves would fail closed, causing a shutdown.

**9) Who is responsible for completing the corrective action(s)?**

Unit process engineer for plant 41.

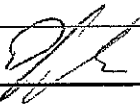
**10) What actions were taken to end the bypass incident and restore normal operation?**

Feed was removed from both reactors once the thermal oxidizer failed. The thermal oxidizer was restarted and after temperature set points were achieved, feed was re-introduced back into the reactors.

**11) Was the Start-up, Shutdown, Malfunction Plan (SSMP) followed?** ☒ Yes ☐ No\*

\*If not, provide explanation:

**12) If the SSMP was not followed, was IDEM notified?** N/A ☐ Yes ☐ No

13) Are revisions to the SSMP needed to better address future bypass incidents? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
If so, provide recommendations:		
Name: Ben Stewart	Signature: 	Date: 3/8/10

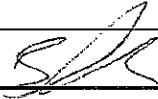
I/2266513.1

13) Are revisions to the SSMP needed to better address future bypass incidents? ☐ Yes ☒ No  
If so, provide recommendations:

Name:

Ben Stamer

Signature:



Date:

3/10/2020

I/2266513.1

## BYPASS INCIDENT REPORT

Plant 41

This report form applies to the following areas:  
Cyano Reactors and Ammonia Recovery System

Complete this form immediately following any bypass of the Thermal Oxidizer.

### 1) Bypass Period

Bypass began: Date: 1/27/2010 Time: 05:17

Bypass ended: Date: 1/27/2010 Time: 05:32

Bypass duration: Hours: 0 Minutes: 15

2) Estimated HAPs emissions: Acetonitrile – 1.16 lbs., Benzene – 0.67 lbs., Xylenes – 0.0023 lbs., Hydrogen Cyanide – 1.11 lbs.

### 3) What was the general cause of the bypass incident?

The natural gas supply pressure dropped below the pressure switch setting.

### 4) What type of bypass occurred? (Check all that apply.)

- |   |   |
|---|---|
| <input type="checkbox"/> Instrument nitrogen less than 60 psi                 | <input type="checkbox"/> Plant shutdown                       |
| <input type="checkbox"/> Instrument air less than 60 psi                      | <input type="checkbox"/> PHD data lost                        |
| <input type="checkbox"/> Stack temperature less than 700°C                    | <input type="checkbox"/> Erratic Thermal Oxidizer temperature |
| <input type="checkbox"/> Chamber temperature greater than 1038°C              | <input type="checkbox"/> Operator error                       |
| <input type="checkbox"/> Stack temperature greater than 982°C                 | <input type="checkbox"/> Mechanical failure                   |
| <input type="checkbox"/> Loss of electrical power                             | <input type="checkbox"/> Process upset                        |
| <input checked="" type="checkbox"/> Other utility disruption [Describe below] | <input type="checkbox"/> Instrument/control parameters        |
| <input type="checkbox"/> Fire eye lost sight of flame                         | <input type="checkbox"/> Other [Describe below]               |
| <input type="checkbox"/> Plant start-up                                       |   |

### 5) What plant area or major equipment was affected (be specific)?

Thermal oxidizer, reactor A and reactor B.

### 6) What is the root cause(s) of the bypass incident?

The plant boilers were upset and during a ramp up, the natural gas supply pressure to the T.O. dropped below the pressure switch setting. Once the bypass occurred, the operator did not remove feed from the reactors. A procedural error was found that allowed for operations to leave feed in the reactor during a bypass event.

7) How did you determine the root cause(s) of the bypass incident?

Process trend analysis.

8) What corrective action(s) has been or will be taken to address the root cause(s) of the bypass incident?

A new gas line that ties directly into the main gas line on the plant site needs to be run. This requires capital approval and the project has been added to the plant capital list. The procedure was redlined for the correction.

9) Who is responsible for completing the corrective action(s)?

Unit process engineer.

10) What actions were taken to end the bypass incident and restore normal operation?

The T.O. was re-lit and when temperatures were achieved, the waste gas valve opened.

11) Was the Start-up, Shutdown, Malfunction Plan (SSMP) followed?

☒ Yes

☐ No\*

\*If not, provide explanation:

12) If the SSMP was not followed, was IDEM notified?

☐ Yes

☐ No

13) Are revisions to the SSMP needed to better address future bypass incidents?

☐ Yes

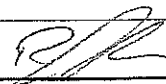
☒ No

If so, provide recommendations:

Name:

Ben Spurio

Signature:



Date:

3/11/2010

## BYPASS INCIDENT REPORT

Plant 41

This report form applies to the following areas:  
Cyano Reactors and Ammonia Recovery System

Complete this form immediately following any bypass of the Thermal Oxidizer.

### 1) Bypass Period

Bypass began: Date: 1/27/2010 Time: 5:35

Bypass ended: Date: 1/27/2010 Time: 5:39

Bypass duration: Hours: 0 Minutes: 4

2) Estimated HAPs emissions: Acetonitrile – 0.31 lbs., Benzene – 0.18 lbs., Xylenes – 0.0006 lbs., Hydrogen Cyanide – 0.29 lbs.

### 3) What was the general cause of the bypass incident?

The thermal oxidizer stack temperature dropped below the low interlock setpoint.

### 4) What type of bypass occurred? (Check all that apply.)

- |   |   |
|---|---|
| <input type="checkbox"/> Instrument nitrogen less than 60 psi         | <input type="checkbox"/> Plant shutdown                       |
| <input type="checkbox"/> Instrument air less than 60 psi              | <input type="checkbox"/> PHD data lost                        |
| <input checked="" type="checkbox"/> Stack temperature less than 700°C | <input type="checkbox"/> Erratic Thermal Oxidizer temperature |
| <input type="checkbox"/> Chamber temperature greater than 1038°C      | <input type="checkbox"/> Operator error                       |
| <input type="checkbox"/> Stack temperature greater than 982°C         | <input type="checkbox"/> Mechanical failure                   |
| <input type="checkbox"/> Loss of electrical power                     | <input type="checkbox"/> Process upset                        |
| <input type="checkbox"/> Other utility disruption [Describe below]    | <input type="checkbox"/> Instrument/control parameters        |
| <input type="checkbox"/> Fire eye lost sight of flame                 | <input type="checkbox"/> Other [Describe below]               |
| <input type="checkbox"/> Plant start-up                               |   |

### 5) What plant area or major equipment was affected (be specific)?

Thermal oxidizer, reactor A and reactor B.

### 6) What is the root cause(s) of the bypass incident?

The plant steam pressure was fluctuating between 100 and 200 psi due to issue at the boiler room. This caused the reactor temperature control to swing leading to a low stack temperature on the thermal oxidizer. Once the bypass occurred, the operator did not remove feed from the reactors. A procedural error was found that allowed for operations to leave feed in the reactor during a bypass event.

7) How did you determine the root cause(s) of the bypass incident?

Process trend analysis.

8) What corrective action(s) has been or will be taken to address the root cause(s) of the bypass incident?

This bypass was due to a plant wide steam failure. Instructions have been given to the process operators that if the thermal oxidizer is nearing a bypass event, the reactors are to be shut down preemptively. The procedure was redlined for the correction.

9) Who is responsible for completing the corrective action(s)?

Unit process engineer.

10) What actions were taken to end the bypass incident and restore normal operation?

The stack temperature increased and the waste gas valve was opened.

11) Was the Start-up, Shutdown, Malfunction Plan (SSMP) followed?

☒ Yes

☐ No\*

\*If not, provide explanation:

12) If the SSMP was not followed, was IDEM notified?

N/A

☐ Yes

☐ No

13) Are revisions to the SSMP needed to better address future bypass incidents?

☐ Yes

☒ No

If so, provide recommendations:

Name:

Ben Sturges

Signature:

*Ben Sturges*

Date:

3/11/2010

## BYPASS INCIDENT REPORT

Plant 41

This report form applies to the following areas:  
Cyano Reactors and Ammonia Recovery System

Complete this form immediately following any bypass of the Thermal Oxidizer.

### 1) Bypass Period

Bypass began: Date: 2/17/2010 Time: 11:53

Bypass ended: Date: 2/17/2010 Time: 11:58

Bypass duration: Hours: 0 Minutes: 5

2) Estimated HAPs emissions: Acetonitrile – 0.37 lbs., Benzene – 0.22 lbs., Xylenes – 0.00075 lbs., Hydrogen Cyanide – 0.36 lbs.

### 3) What was the general cause of the bypass incident?

The 403 column began to flood leading to a high 403 temperature. This increased the amount of waste gas carried over to the thermal oxidizer, causing the excess oxygen to drop below the interlock value, shutting down the thermal oxidizer.

### 4) What type of bypass occurred? (Check all that apply.)

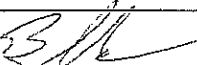
- |  |   |
|--|---|
| <input type="checkbox"/> Instrument nitrogen less than 60 psi      | <input type="checkbox"/> Plant shutdown                       |
| <input type="checkbox"/> Instrument air less than 60 psi           | <input type="checkbox"/> PHD data lost                        |
| <input type="checkbox"/> Stack temperature less than 700°C         | <input type="checkbox"/> Erratic Thermal Oxidizer temperature |
| <input type="checkbox"/> Chamber temperature greater than 1038°C   | <input type="checkbox"/> Operator error                       |
| <input type="checkbox"/> Stack temperature greater than 982°C      | <input type="checkbox"/> Mechanical failure                   |
| <input type="checkbox"/> Loss of electrical power                  | <input checked="" type="checkbox"/> Process upset             |
| <input type="checkbox"/> Other utility disruption [Describe below] | <input type="checkbox"/> Instrument/control parameters        |
| <input type="checkbox"/> Fire eye lost sight of flame              | <input type="checkbox"/> Other [Describe below]               |
| <input type="checkbox"/> Plant start-up                            |   |

### 5) What plant area or major equipment was affected (be specific)?

403 Column, Thermal Oxidizer

### 6) What is the root cause(s) of the bypass incident?

Solids build up in the 403 bottoms caused the bottoms flow to stop, leading to the flooding issue. The root cause of the solids build up is catalyst from the reactors. This catalyst is carried out through the primary cooler, continues to the LDU and is sent back to the ammonia recovery system in the raffinate.

<b>7) How did you determine the root cause(s) of the bypass incident?</b> The root cause was identified based on trending data, interview with operations staff and using historical knowledge of the process.		
<b>8) What corrective action(s) has been or will be taken to address the root cause(s) of the bypass incident?</b> Operations steamed out the 403 bottoms line to clear the line of solids. The 403 bottoms is on the maintenance schedule to be cleaned out during the next shut down. A valve output alarm is being installed on the 403 level controller to notify operations earlier to help prevent these failures. Additional countermeasures are being considered for preventing catalyst from being circulated through the ammonia recovery system.		
<b>9) Who is responsible for completing the corrective action(s)?</b> Unit process engineer.		
<b>10) What actions were taken to end the bypass incident and restore normal operation?</b> Feed was removed from both reactors once the thermal oxidizer failed. The thermal oxidizer was restarted and after temperature set points were achieved, feed was re-introduced back into the reactors.		
<b>11) Was the Start-up, Shutdown, Malfunction Plan (SSMP) followed?</b> <span style="float: right;"><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No*</span> *If not, provide explanation:		
<b>12) If the SSMP was not followed, was IDEM notified?</b> <span style="float: right;">N/A <input type="checkbox"/> Yes <input type="checkbox"/> No</span>		
<b>13) Are revisions to the SSMP needed to better address future bypass incidents?</b> <span style="float: right;"><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</span> If so, provide recommendations:		
<b>Name:</b> Ben Ganser	<b>Signature:</b> 	<b>Date:</b> 3/11/10

## BYPASS INCIDENT REPORT

Plant 41

This report form applies to the following areas:  
Cyano Reactors and Ammonia Recovery System

Complete this form immediately following any bypass of the Thermal Oxidizer.

### 1) Bypass Period

**Bypass began:** Date: 2/17/2010 Time: 12:27

**Bypass ended:** Date: 2/17/2010 Time: 12:30

**Bypass duration:** Hours: 0 Minutes: 3

**2) Estimated HAPs emissions:** Acetonitrile –0.08 lbs., Benzene – 0.05 lbs., Xylenes – 0.00016 lbs., Hydrogen Cyanide – 0.08 lbs.

### 3) What was the general cause of the bypass incident?

High chamber temperature interlock during thermal oxidizer restart.

### 4) What type of bypass occurred? (Check all that apply.)

- |  |   |
|--|---|
| <input type="checkbox"/> Instrument nitrogen less than 60 psi      | <input type="checkbox"/> Plant shutdown                       |
| <input type="checkbox"/> Instrument air less than 60 psi           | <input type="checkbox"/> PHD data lost                        |
| <input type="checkbox"/> Stack temperature less than 700°C         | <input type="checkbox"/> Erratic Thermal Oxidizer temperature |
| <input type="checkbox"/> Chamber temperature greater than 1038°C   | <input checked="" type="checkbox"/> Operator error            |
| <input type="checkbox"/> Stack temperature greater than 982°C      | <input type="checkbox"/> Mechanical failure                   |
| <input type="checkbox"/> Loss of electrical power                  | <input checked="" type="checkbox"/> Process upset             |
| <input type="checkbox"/> Other utility disruption [Describe below] | <input type="checkbox"/> Instrument/control parameters        |
| <input type="checkbox"/> Fire eye lost sight of flame              | <input type="checkbox"/> Other [Describe below]               |
| <input type="checkbox"/> Plant start-up                            |   |

### 5) What plant area or major equipment was affected (be specific)?

Thermal Oxidizer.

### 6) What is the root cause(s) of the bypass incident?

The thermal oxidizer was not allowed the appropriate amount of time to stabilize itself during the introduction of feed from the base plant. This lead to high excess oxygen, causing a low blower output. The lack of fresh air being introduced into the chamber caused the temperature to elevate leading to the bypass.

7) How did you determine the root cause(s) of the bypass incident?

Process trend analysis.

8) What corrective action(s) has been or will be taken to address the root cause(s) of the bypass incident?

The reactor start up procedure was reviewed for accuracy. The start up plan outlined in the procedure was reviewed with the operations staff to ensure that proper start up procedures after bypass incidents are followed. An error was found in the ammonia recovery system procedure that was corrected.

9) Who is responsible for completing the corrective action(s)?

Unit process engineer.

10) What actions were taken to end the bypass incident and restore normal operation?

Feed was removed from both reactors once the thermal oxidizer failed. The thermal oxidizer was restarted and after temperature set points were achieved, feed was re-introduced back into the reactors.

11) Was the Start-up, Shutdown, Malfunction Plan (SSMP) followed?

☒ Yes

☐ No\*

\*If not, provide explanation:

12) If the SSMP was not followed, was IDEM notified?

N/A

☐ Yes

☐ No

13) Are revisions to the SSMP needed to better address future bypass incidents?

☐ Yes

☒ No

If so, provide recommendations:

Name:

*Ben Starnes*

Signature:

*B. Starnes*

Date:

3/11/10

## BYPASS INCIDENT REPORT

Plant 41

This report form applies to the following areas:  
Cyano Reactors and Ammonia Recovery System

Complete this form immediately following any bypass of the Thermal Oxidizer.

### 1) Bypass Period

Bypass began:

Date: 2/17/2010

Time: 13:40

Bypass ended:

Date: 2/17/2010

Time: 13:41

Bypass duration:

Hours: 0

Minutes: 1

2) Estimated HAPs emissions: Acetonitrile – 0.01 lbs., Benzene – 0.01 lbs., Xylenes – 0.00003 lbs., Hydrogen Cyanide – 0.01 lbs.

### 3) What was the general cause of the bypass incident?

High chamber temperature interlock during thermal oxidizer restart.

### 4) What type of bypass occurred? (Check all that apply.)

- ☐ Instrument nitrogen less than 60 psi
- ☐ Instrument air less than 60 psi
- ☐ Stack temperature less than 700°C
- ☐ Chamber temperature greater than 1038°C
- ☐ Stack temperature greater than 982°C
- ☐ Loss of electrical power
- ☐ Other utility disruption [Describe below]
- ☐ Fire eye lost sight of flame
- ☐ Plant start-up

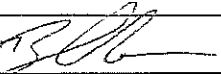
- ☐ Plant shutdown
- ☐ PHD data lost
- ☐ Erratic Thermal Oxidizer temperature
- ☒ Operator error
- ☐ Mechanical failure
- ☒ Process upset
- ☐ Instrument/control parameters
- ☐ Other [Describe below]

### 5) What plant area or major equipment was affected (be specific)?

Thermal Oxidizer.

### 6) What is the root cause(s) of the bypass incident?

The thermal oxidizer was not allowed the appropriate amount of time to stabilize itself during the introduction of feed from the base plant. This lead to high excess oxygen, causing a low blower output. The lack of fresh air being introduced into the chamber caused the temperature to elevate leading to the bypass.

<b>7) How did you determine the root cause(s) of the bypass incident?</b> Process trend analysis.		
<b>8) What corrective action(s) has been or will be taken to address the root cause(s) of the bypass incident?</b> The reactor start up procedure was reviewed for accuracy. The start up plan outlined in the procedure was reviewed with the operations staff to ensure that proper start up procedures after bypass incidents are followed. An error was found in the ammonia recovery system procedure that was corrected.		
<b>9) Who is responsible for completing the corrective action(s)?</b> Unit process engineer.		
<b>10) What actions were taken to end the bypass incident and restore normal operation?</b> Feed was removed from both reactors once the thermal oxidizer failed. The thermal oxidizer was restarted and after temperature set points were achieved, feed was re-introduced back into the reactors.		
<b>11) Was the Start-up, Shutdown, Malfunction Plan (SSMP) followed?</b> <span style="float: right;"><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No*</span> *If not, provide explanation:		
<b>12) If the SSMP was not followed, was IDEM notified?</b> <span style="float: right;">N/A <input type="checkbox"/> Yes <input type="checkbox"/> No</span>		
<b>13) Are revisions to the SSMP needed to better address future bypass incidents?</b> <span style="float: right;"><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</span> If so, provide recommendations:		
<b>Name:</b> Ben Stewart	<b>Signature:</b> 	<b>Date:</b> 3/11/10

## BYPASS INCIDENT REPORT

### Plant 41

This report form applies to the following areas:  
Cyano Reactors and Ammonia Recovery System

Complete this form immediately following any bypass of the Thermal Oxidizer.

#### 1) Bypass Period

Bypass began:

Date: 2/27/2010

Time: 20:19

Bypass ended:

Date: 2/27/2010

Time: 20:22

Bypass duration:

Hours: 0

Minutes: 3

2) Estimated HAPs emissions: Acetonitrile – 0.14 lbs., Benzene – 0.08 lbs., Xylenes – 0.00029 lbs., Hydrogen Cyanide – 0.14 lbs.

#### 3) What was the general cause of the bypass incident?

The supply pressure of the plant air for the thermal oxidizer went low causing a thermal oxidizer shutdown.

#### 4) What type of bypass occurred? (Check all that apply.)

- ☐ Instrument nitrogen less than 60 psi
- ☒ Instrument air less than 60 psi
- ☐ Stack temperature less than 700°C
- ☐ Chamber temperature greater than 1038°C
- ☐ Stack temperature greater than 982°C
- ☐ Loss of electrical power
- ☐ Other utility disruption [Describe below]
- ☐ Fire eye lost sight of flame
- ☐ Plant start-up

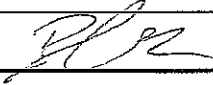
- ☐ Plant shutdown
- ☐ PHD data lost
- ☐ Erratic Thermal Oxidizer temperature
- ☐ Operator error
- ☐ Mechanical failure
- ☐ Process upset
- ☐ Instrument/control parameters
- ☐ Other [Describe below]

#### 5) What plant area or major equipment was affected (be specific)?

Thermal oxidizer.

#### 6) What is the root cause(s) of the bypass incident?

Two other units were using high volumes of plant air at the same time causing the supply pressure to the thermal oxidizer to fall below the trip point.

<b>7) How did you determine the root cause(s) of the bypass incident?</b> PLC alarm log at the thermal oxidizer.		
<b>8) What corrective action(s) has been or will be taken to address the root cause(s) of the bypass incident?</b> An MOC has been written to bring the plant air pressure reading back to the DCS and install a low pressure alarm to provide response time in the event that this failure happens again. Additionally, the MOC is currently drafted to remove the low plant air interlock due to redundant systems. Without plant air, all process and gas valves would fail closed, causing a shutdown.		
<b>9) Who is responsible for completing the corrective action(s)?</b> Unit process engineer.		
<b>10) What actions were taken to end the bypass incident and restore normal operation?</b> Feed was removed from both reactors once the thermal oxidizer failed. The thermal oxidizer was restarted and after temperature set points were achieved, feed was re-introduced back into the reactors.		
<b>11) Was the Start-up, Shutdown, Malfunction Plan (SSMP) followed?</b> <span style="float: right;"><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No*</span> *If not, provide explanation:		
<b>12) If the SSMP was not followed, was IDEM notified?</b> <span style="float: right;">N/A <input type="checkbox"/> Yes <input type="checkbox"/> No</span>		
<b>13) Are revisions to the SSMP needed to better address future bypass incidents?</b> <span style="float: right;"><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</span> If so, provide recommendations:		
<b>Name:</b> Ben Stenwig	<b>Signature:</b> 	<b>Date:</b> 3/11/10

## BYPASS INCIDENT REPORT

Plant 41

This report form applies to the following areas:  
Cyano Reactors and Ammonia Recovery System

Complete this form immediately following any bypass of the Thermal Oxidizer.

### 1) Bypass Period

Bypass began:

Date: 3/12/2010

Time: 00:38

Bypass ended:

Date: 3/12/2010

Time: 00:41

Bypass duration:

Hours: 0

Minutes: 3

2) Estimated HAPs emissions: Acetonitrile – 0.10 lbs., Benzene – 0.06 lbs., Xylenes – 0.00021 lbs., Hydrogen Cyanide – 0.10 lbs.

### 3) What was the general cause of the bypass incident?

Low excess oxygen concentration.

### 4) What type of bypass occurred? (Check all that apply.)

- ☐ Instrument nitrogen less than 60 psi
- ☐ Instrument air less than 60 psi
- ☐ Stack temperature less than 700°C
- ☐ Chamber temperature greater than 1038°C
- ☐ Stack temperature greater than 982°C
- ☐ Loss of electrical power
- ☐ Other utility disruption [Describe below]
- ☐ Fire eye lost sight of flame
- ☐ Plant start-up

- ☐ Plant shutdown
- ☐ PHD data lost
- ☐ Erratic Thermal Oxidizer temperature
- ☐ Operator error
- ☐ Mechanical failure
- ☐ Process upset
- ☒ Instrument/control parameters
- ☐ Other [Describe below]

### 5) What plant area or major equipment was affected (be specific)?

Thermal oxidizer.

### 6) What is the root cause(s) of the bypass incident?

A surge of CO<sub>2</sub> from the 404 column entered the thermal oxidizer, causing the excess oxygen content to drop below the interlock. The surge was caused from plugging in the overheads line of the 404 column. Once the line pluggage was cleared, the high pressure on the column vented off a high volume of CO<sub>2</sub> to the 403 column and on to the thermal oxidizer.

7) How did you determine the root cause(s) of the bypass incident?

Process trend analysis.

8) What corrective action(s) has been or will be taken to address the root cause(s) of the bypass incident?

Various ongoing efforts are underway to help eliminate multiple issues around the ammonia recovery system. These include replacement of the 401 bottoms pumps, more diligent cleaning schedules around the 403 column and the primary cooler. Piping modifications around the 403 bottoms are being considered to allow for an increased flow through the column which will provide a lower operating temperature and less CO2 recycle. This will also provide for better ammonia absorption and a steadier thermal oxidizer temperature control.

9) Who is responsible for completing the corrective action(s)?

Plant 41 unit process engineer.

10) What actions were taken to end the bypass incident and restore normal operation?

Feed was removed from both reactors once the thermal oxidizer failed. The thermal oxidizer was restarted and after temperature set points were achieved, feed was re-introduced back into the reactors.

11) Was the Start-up, Shutdown, Malfunction Plan (SSMP) followed?

☒ Yes

☐ No\*

\*If not, provide explanation:

12) If the SSMP was not followed, was IDEM notified?

N/A

☐ Yes

☐ No

13) Are revisions to the SSMP needed to better address future bypass incidents?

☐ Yes

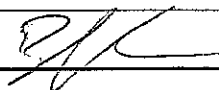
☒ No

If so, provide recommendations:

Name:

Ben Stenvers

Signature:



Date:

3/29/10

## BYPASS INCIDENT REPORT

Plant 41

This report form applies to the following areas:  
Cyano Reactors and Ammonia Recovery System

Complete this form immediately following any bypass of the Thermal Oxidizer.

### 1) Bypass Period

**Bypass began:** Date: 3/31/2010 Time: 22:26

**Bypass ended:** Date: 3/31/2010 Time: 22:28

**Bypass duration:** Hours: 0 Minutes: 2

**2) Estimated HAPs emissions:** Acetonitrile – 0.11 lbs., Benzene – 0.06 lbs., Xylenes – 0.00021 lbs., Hydrogen Cyanide – 0.10 lbs.

### 3) What was the general cause of the bypass incident?

External power failure caused a plant shutdown.

### 4) What type of bypass occurred? (Check all that apply.)

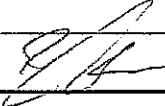
- |  |   |
|--|---|
| <input type="checkbox"/> Instrument nitrogen less than 60 psi      | <input type="checkbox"/> Plant shutdown                       |
| <input type="checkbox"/> Instrument air less than 60 psi           | <input type="checkbox"/> PHD data lost                        |
| <input type="checkbox"/> Stack temperature less than 700°C         | <input type="checkbox"/> Erratic Thermal Oxidizer temperature |
| <input type="checkbox"/> Chamber temperature greater than 1038°C   | <input type="checkbox"/> Operator error                       |
| <input type="checkbox"/> Stack temperature greater than 982°C      | <input type="checkbox"/> Mechanical failure                   |
| <input checked="" type="checkbox"/> Loss of electrical power       | <input type="checkbox"/> Process upset                        |
| <input type="checkbox"/> Other utility disruption [Describe below] | <input type="checkbox"/> Instrument/control parameters        |
| <input type="checkbox"/> Fire eye lost sight of flame              | <input type="checkbox"/> Other [Describe below]               |
| <input type="checkbox"/> Plant start-up                            |   |

### 5) What plant area or major equipment was affected (be specific)?

Thermal Oxidizer, Reactors

### 6) What is the root cause(s) of the bypass incident?

At 10:26 PM, IPL experienced 2 breaker operations in the 34kV system that serves the Vertellus plant. The loss of power at the plant site leads to pump failures and equipment shut downs.

<b>7) How did you determine the root cause(s) of the bypass incident?</b> The entire site lost electrical power.		
<b>8) What corrective action(s) has been or will be taken to address the root cause(s) of the bypass incident?</b> None, this was an external failure that could not have been prevented.		
<b>9) Who is responsible for completing the corrective action(s)?</b> N/A		
<b>10) What actions were taken to end the bypass incident and restore normal operation?</b> Feed was removed from both reactors once the thermal oxidizer failed. The thermal oxidizer was restarted and after temperature set points were achieved, feed was re-introduced back into the reactors.		
<b>11) Was the Start-up, Shutdown, Malfunction Plan (SSMP) followed?</b> <div style="float: right;"> <input checked="" type="checkbox"/> Yes           <input type="checkbox"/> No*         </div> *If not, provide explanation:		
<b>12) If the SSMP was not followed, was IDEM notified?</b> <div style="float: right;">         N/A         <input type="checkbox"/> Yes         <input type="checkbox"/> No       </div>		
<b>13) Are revisions to the SSMP needed to better address future bypass incidents?</b> <div style="float: right;"> <input type="checkbox"/> Yes         <input checked="" type="checkbox"/> No       </div> If so, provide recommendations:		
<b>Name:</b> Ben Stewart	<b>Signature:</b> 	<b>Date:</b> 4/26/10

## BYPASS INCIDENT REPORT

Plant 41

This report form applies to the following areas:  
Cyano Reactors and Ammonia Recovery System

Complete this form immediately following any bypass of the Thermal Oxidizer.

### 1) Bypass Period

**Bypass began:**

Date: 3/31/2010

Time: 23:38

**Bypass ended:**

Date: 3/31/2010

Time: 23:40

**Bypass duration:**

Hours: 0

Minutes: 2

**2) Estimated HAPs emissions:** Acetonitrile – 0.02 lbs., Benzene – 0.01 lbs., Xylenes – 0.00005 lbs., Hydrogen Cyanide – 0.02 lbs.

### 3) What was the general cause of the bypass incident?

Upon restart of the thermal oxidizer after a plant wide power failure, the chamber temperature was greater than 1038°C causing a bypass.

### 4) What type of bypass occurred? (Check all that apply.)

- ☐ Instrument nitrogen less than 60 psi
- ☐ Instrument air less than 60 psi
- ☐ Stack temperature less than 700°C
- ☒ Chamber temperature greater than 1038°C
- ☐ Stack temperature greater than 982°C
- ☐ Loss of electrical power
- ☐ Other utility disruption [Describe below]
- ☐ Fire eye lost sight of flame
- ☐ Plant start-up

- ☐ Plant shutdown
- ☐ PHD data lost
- ☐ Erratic Thermal Oxidizer temperature
- ☐ Operator error
- ☐ Mechanical failure
- ☐ Process upset
- ☐ Instrument/control parameters
- ☐ Other [Describe below]

### 5) What plant area or major equipment was affected (be specific)?

Thermal oxidizer, reactor A.

### 6) What is the root cause(s) of the bypass incident?

During the restart of reactor A, following a plant wide power failure, the chamber temperature reached its interlock value and shut down the thermal oxidizer. This was caused by insufficient air movement due to the elevated excess oxygen. The cause of the excess oxygen was insufficient combustion of organics coupled with low air flow causing a higher retention time. The operator did not introduce enough feed to the reactor to bring down the oxygen level so that

the air blower at the thermal oxidizer could aid in the transport of heat out of the chamber.

**7) How did you determine the root cause(s) of the bypass incident?**

Process trend analysis.

**8) What corrective action(s) has been or will be taken to address the root cause(s) of the bypass incident?**

Details regarding the amount of feed to add during proper start up will be added to the reactor run sheet. Additional communication will be shared with the operations staff in regards to this bypass event. A code modification is being routed through an MOC to step changed the excess oxygen set point during start up activities to allow for greater air flow and a lower retention time.

**9) Who is responsible for completing the corrective action(s)?**

Unit process engineer.

**10) What actions were taken to end the bypass incident and restore normal operation?**

Feed was removed from both reactors once the thermal oxidizer failed. The thermal oxidizer was restarted and after temperature set points were achieved, feed was re-introduced back into the reactors.

**11) Was the Start-up, Shutdown, Malfunction Plan (SSMP) followed?**

☒ Yes

☐ No\*

\*If not, provide explanation:

**12) If the SSMP was not followed, was IDEM notified?**

N/A

☐ Yes

☐ No

**13) Are revisions to the SSMP needed to better address future bypass incidents?**

☐ Yes

☒ No

If so, provide recommendations:

Name: Ben Stearns

Signature: 

Date: 4/26/10

## BYPASS INCIDENT REPORT

Plant 41

This report form applies to the following areas:  
Cyano Reactors and Ammonia Recovery System

Complete this form immediately following any bypass of the Thermal Oxidizer.

### 1) Bypass Period

Bypass began: Date: 4/9/2010 Time: 09:14

Bypass ended: Date: 4/9/2010 Time: 09:16

Bypass duration: Hours: Minutes: 2

2) Estimated HAPs emissions: Acetonitrile-0.07 lbs., Benzene-0.04 lbs., Xylene-0.00015 lbs., Hydrogen Cyanide-0.07 lbs.

### 3) What was the general cause of the bypass incident?

Low excess oxygen concentration.

### 4) What type of bypass occurred? (Check all that apply.)

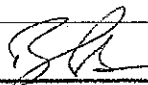
- |   |   |
|---|---|
| <ul style="list-style-type: none"><li><input type="checkbox"/> Instrument nitrogen less than 60 psi</li><li><input type="checkbox"/> Instrument air less than 60 psi</li><li><input type="checkbox"/> Stack temperature less than 700°C</li><li><input type="checkbox"/> Chamber temperature greater than 1038°C</li><li><input type="checkbox"/> Stack temperature greater than 982°C</li><li><input type="checkbox"/> Loss of electrical power</li><li><input type="checkbox"/> Other utility disruption [Describe below]</li><li><input type="checkbox"/> Fire eye lost sight of flame</li><li><input type="checkbox"/> Plant start-up</li></ul> | <ul style="list-style-type: none"><li><input type="checkbox"/> Plant shutdown</li><li><input type="checkbox"/> PHD data lost</li><li><input type="checkbox"/> Erratic Thermal Oxidizer temperature</li><li><input type="checkbox"/> Operator error</li><li><input type="checkbox"/> Mechanical failure</li><li><input type="checkbox"/> Process upset</li><li><input checked="" type="checkbox"/> Instrument/control parameters</li><li><input type="checkbox"/> Other [Describe below]</li></ul> |
|---|---|

### 5) What plant area or major equipment was affected (be specific)?

Thermal oxidizer.

### 6) What is the root cause(s) of the bypass incident?

A surge of CO<sub>2</sub> from the 404 column entered the thermal oxidizer, causing the excess oxygen content to drop below the interlock. The surge was caused from plugging in the overheads line of the 404 column. Once the line pluggage was cleared, the high pressure on the column vented off a high volume of CO<sub>2</sub> to the 403 column and on to the thermal oxidizer.

<b>7) How did you determine the root cause(s) of the bypass incident?</b> Process trend analysis.		
<b>8) What corrective action(s) has been or will be taken to address the root cause(s) of the bypass incident?</b> The plant was shut down in order to address the root cause of the incident. The 404 column packing was pulled and cleaned.		
<b>9) Who is responsible for completing the corrective action(s)?</b> Unit Process Engineer.		
<b>10) What actions were taken to end the bypass incident and restore normal operation?</b> Feed was removed from both reactors once the thermal oxidizer failed.		
<b>11) Was the Start-up, Shutdown, Malfunction Plan (SSMP) followed?</b> <span style="float: right;"><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No*</span> *If not, provide explanation:		
<b>12) If the SSMP was not followed, was IDEM notified?</b> <span style="float: right;">N/A <input type="checkbox"/> Yes <input type="checkbox"/> No</span>		
<b>13) Are revisions to the SSMP needed to better address future bypass incidents?</b> <span style="float: right;"><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</span> If so, provide recommendations:		
<b>Name:</b> Ben Stewart	<b>Signature:</b> 	<b>Date:</b> 4/26/10

## BYPASS INCIDENT REPORT

Plant 41

This report form applies to the following areas:  
Cyano Reactors and Ammonia Recovery System

Complete this form immediately following any bypass of the Thermal Oxidizer.

### 1) Bypass Period

Bypass began:

Date: 5/5/2010

Time: 21:34

Bypass ended:

Date: 5/5/2010

Time: 21:37

Bypass duration:

Hours:

Minutes: 3

2) Estimated HAPs emissions: Acetonitrile-0.19 lbs., Benzene-0.11 lbs., Xylene-0.00038 lbs., Hydrogen Cyanide-0.18 lbs.

### 3) What was the general cause of the bypass incident?

High stack temperature caused the bypass event.

### 4) What type of bypass occurred? (Check all that apply.)

- ☐ Instrument nitrogen less than 60 psi
- ☐ Instrument air less than 60 psi
- ☐ Stack temperature less than 700°C
- ☐ Chamber temperature greater than 1038°C
- ☒ Stack temperature greater than 1032°C
- ☐ Loss of electrical power
- ☐ Other utility disruption [Describe below]
- ☐ Fire eye lost sight of flame
- ☐ Plant start-up

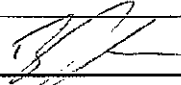
- ☐ Plant shutdown
- ☐ PHD data lost
- ☐ Erratic Thermal Oxidizer temperature
- ☐ Operator error
- ☐ Mechanical failure
- ☐ Process upset
- ☐ Instrument/control parameters
- ☐ Other [Describe below]

### 5) What plant area or major equipment was affected (be specific)?

Plant 41 thermal oxidizer, 401 column bottoms pump.

### 6) What is the root cause(s) of the bypass incident?

The 401 column west bottoms pump failed and could not be restarted in time to prevent the bypass incident. When the 404 column feed was lost (401 bottoms pump), this caused the 402 column to empty. Without 402 column bottoms flow, there is no sprays entering the 403 column and the top temperature began to rise rapidly. This temperature was carried onto the thermal oxidizer and caused the bypass.

<b>7) How did you determine the root cause(s) of the bypass incident?</b> Process trend analysis.		
<b>8) What corrective action(s) has been or will be taken to address the root cause(s) of the bypass incident?</b> The event occurred during a heavy rain fall. Once the system is switched to the east pump, the wiring on the west pump will be inspected.		
<b>9) Who is responsible for completing the corrective action(s)?</b> Unit process engineer.		
<b>10) What actions were taken to end the bypass incident and restore normal operation?</b> Feed was removed from both reactors once the thermal oxidizer failed. The pump was restarted and once the ammonia recovery system and thermal oxidizer were running, the reactors were re-started.		
<b>11) Was the Start-up, Shutdown, Malfunction Plan (SSMP) followed?</b> <div style="float: right;"> <input checked="" type="checkbox"/> Yes           <input type="checkbox"/> No*         </div> *If not, provide explanation:		
<b>12) If the SSMP was not followed, was IDEM notified?</b> <div style="float: right;">           N/A           <input type="checkbox"/> Yes           <input type="checkbox"/> No         </div>		
<b>13) Are revisions to the SSMP needed to better address future bypass incidents?</b> <div style="float: right;"> <input type="checkbox"/> Yes           <input checked="" type="checkbox"/> No         </div> If so, provide recommendations:		
<b>Name:</b> Ben Stevens	<b>Signature:</b> 	<b>Date:</b> 5/20/2010

## BYPASS INCIDENT REPORT

Plant 41

This report form applies to the following areas:  
Cyano Reactors and Ammonia Recovery System

Complete this form immediately following any bypass of the Thermal Oxidizer.

### 1) Bypass Period

Bypass began:

Date: 6/14/2010

Time: 10:06

Bypass ended:

Date: 6/14/2010

Time: 10:10

Bypass duration:

Hours:

Minutes: 4

2) Estimated HAPs emissions: Acetonitrile-0.20 lbs., Benzene-0.12 lbs., Xylene-0.00040 lbs.,  
Hydrogen Cyanide-0.19 lbs.

### 3) What was the general cause of the bypass incident?

Low instrument air pressure.

### 4) What type of bypass occurred? (Check all that apply.)

- ☐ Instrument nitrogen less than 60 psi
- ☒ Instrument air less than 60 psi
- ☐ Stack temperature less than 700°C
- ☐ Chamber temperature greater than 1038°C
- ☐ Stack temperature greater than 982°C
- ☐ Loss of electrical power
- ☐ Other utility disruption [Describe below]
- ☐ Fire eye lost sight of flame
- ☐ Plant start-up

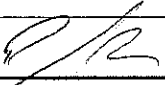
- ☐ Plant shutdown
- ☐ PHD data lost
- ☐ Erratic Thermal Oxidizer temperature
- ☐ Operator error
- ☐ Mechanical failure
- ☐ Process Upset
- ☐ Instrument/control parameters
- ☐ Other [Describe below]

### 5) What plant area or major equipment was affected (be specific)?

Thermal oxidizer.

### 6) What is the root cause(s) of the bypass incident?

After completion of a plant shutdown, the orifices in the air purge lines were not put back in. When the plant restarted, the air pressure was running close to the interlock value of 60 psig. An adjacent user began blowing a line with air and the pressure dropped below 60 psig.

<b>7) How did you determine the root cause(s) of the bypass incident?</b> Process trend analysis and equipment inspections.		
<b>8) What corrective action(s) has been or will be taken to address the root cause(s) of the bypass incident?</b> A central orifice will be installed in the main air line to the thermal oxidizer.		
<b>9) Who is responsible for completing the corrective action(s)?</b> Unit process engineer.		
<b>10) What actions were taken to end the bypass incident and restore normal operation?</b> Feed was removed from both reactors and the plant was re-started once the thermal oxidizer was re-lit.		
<b>11) Was the Start-up, Shutdown, Malfunction Plan (SSMP) followed?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No* *If not, provide explanation:		
<b>12) If the SSMP was not followed, was IDEM notified?</b> N/A <input type="checkbox"/> Yes <input type="checkbox"/> No		
<b>13) Are revisions to the SSMP needed to better address future bypass incidents?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If so, provide recommendations:		
<b>Name:</b> Ben Steiner	<b>Signature:</b> 	<b>Date:</b> 7/14/2010

## BYPASS INCIDENT REPORT

Plant 41

This report form applies to the following areas:  
Cyano Reactors and Ammonia Recovery System

Complete this form immediately following any bypass of the Thermal Oxidizer.

### 1) Bypass Period

Bypass began: Date: 6/15/2010 Time: 6:39

Bypass ended: Date: 6/15/2010 Time: 6:42

Bypass duration: Hours: Minutes: 3

2) Estimated HAPs emissions: Acetonitrile-0.08 lbs., Benzene-0.05 lbs., Xylene-0.00017 lbs.,  
Hydrogen Cyanide-0.08 lbs.

### 3) What was the general cause of the bypass incident?

High high level switch interlock from the 403 column knock out pot.

### 4) What type of bypass occurred? (Check all that apply.)

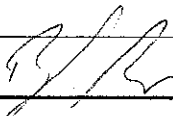
- |  |   |
|--|---|
| <input type="checkbox"/> Instrument nitrogen less than 60 psi      | <input type="checkbox"/> Plant shutdown                       |
| <input type="checkbox"/> Instrument air less than 60 psi           | <input type="checkbox"/> PHD data lost                        |
| <input type="checkbox"/> Stack temperature less than 700°C         | <input type="checkbox"/> Erratic Thermal Oxidizer temperature |
| <input type="checkbox"/> Chamber temperature greater than 1038°C   | <input type="checkbox"/> Operator error                       |
| <input type="checkbox"/> Stack temperature greater than 982°C      | <input type="checkbox"/> Mechanical failure                   |
| <input type="checkbox"/> Loss of electrical power                  | X Process upset   |
| <input type="checkbox"/> Other utility disruption [Describe below] | <input type="checkbox"/> Instrument/control parameters        |
| <input type="checkbox"/> Fire eye lost sight of flame              | <input type="checkbox"/> Other [Describe below]               |
| <input type="checkbox"/> Plant start-up                            |   |

### 5) What plant area or major equipment was affected (be specific)?

Thermal oxidizer.

### 6) What is the root cause(s) of the bypass incident?

During preparation for the 503 cooler cleaning, reactor rates were reduced and cooling was decreased to the reactors. Procedures were followed; however, the reactor temperatures began to rise, leading to an elevated 403 column top temperature. Coupled with this, the 403 column flooded. This caused circulation flow to stop through the columns, which led to even higher 403 top temperatures. With the excess of vapors entering the knock out pot and condensing,

the high high level switch interlock was activated.		
<b>7) How did you determine the root cause(s) of the bypass incident?</b> Process trend analysis and equipment inspections.		
<b>8) What corrective action(s) has been or will be taken to address the root cause(s) of the bypass incident?</b> Procedures were reviewed and the process data was also reviewed to ensure that decreasing the reactor feed was done correctly. The 403 column will be inspected upon the next unit shutdown to determine the root cause of the column flooding.		
<b>9) Who is responsible for completing the corrective action(s)?</b> Unit process engineer.		
<b>10) What actions were taken to end the bypass incident and restore normal operation?</b> Feed was removed from both reactors and the plant was re-started once the thermal oxidizer was re-lit.		
<b>11) Was the Start-up, Shutdown, Malfunction Plan (SSMP) followed?</b> <span style="float: right;"><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No*</span> *If not, provide explanation:		
<b>12) If the SSMP was not followed, was IDEM notified?</b> <span style="float: right;">N/A <input type="checkbox"/> Yes <input type="checkbox"/> No</span>		
<b>13) Are revisions to the SSMP needed to better address future bypass incidents?</b> <span style="float: right;"><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</span> If so, provide recommendations:		
<b>Name:</b> Ben Steiner	<b>Signature:</b> 	<b>Date:</b> 7/14/2008

## BYPASS INCIDENT REPORT

Plant 41

This report form applies to the following areas:  
Cyano Reactors and Ammonia Recovery System

Complete this form immediately following any bypass of the Thermal Oxidizer.

### 1) Bypass Period

Bypass began:

Date: 6/18/2010

Time: 23:12

Bypass ended:

Date: 6/18/2010

Time: 23:14

Bypass duration:

Hours:

Minutes: 3

2) Estimated HAPs emissions: Acetonitrile-0.11 lbs., Benzene-0.08 lbs., Xylene-0.00022 lbs., Hydrogen Cyanide-0.11 lbs.

### 3) What was the general cause of the bypass incident?

404 Column upset caused the stack temperature to reach the interlock value of 1032°C.

### 4) What type of bypass occurred? (Check all that apply.)

- ☐ Instrument nitrogen less than 60 psi
- ☐ Instrument air less than 60 psi
- ☐ Stack temperature less than 700°C
- ☐ Chamber temperature greater than 1038°C
- ☒ Stack temperature greater than 1032°C
- ☐ Loss of electrical power
- ☐ Other utility disruption [Describe below]
- ☐ Fire eye lost sight of flame
- ☐ Plant start-up

- ☐ Plant shutdown
- ☐ PHD data lost
- ☐ Erratic Thermal Oxidizer temperature
- ☐ Operator error
- ☐ Mechanical failure
- ☒ Process upset
- ☐ Instrument/control parameters
- ☐ Other [Describe below]

### 5) What plant area or major equipment was affected (be specific)?

Thermal oxidizer.

### 6) What is the root cause(s) of the bypass incident?

The top pressure transmitter on the 404 column became plugged and gave a false reading. This caused the heat on the column to back off, leading to a low column pressure. Without significant pressure, the 404 column cannot feed the 402 column and all circulation is lost in the ammonia recovery system. This lead to a high 403 top temperature and to the high stack temperature.

**7) How did you determine the root cause(s) of the bypass incident?**

Process trend analysis and equipment inspections.

**8) What corrective action(s) has been or will be taken to address the root cause(s) of the bypass incident?**

The top pressure transmitter was found without insulation on it. During the last plant shut down, this transmitter was replaced and the insulation was never re-applied. A notification was entered to re-insulate the transmitter. This incident was communicated to maintenance along with the need to re-insulate instrumentation after maintenance work was stressed.

**9) Who is responsible for completing the corrective action(s)?**

Unit process engineer.

**10) What actions were taken to end the bypass incident and restore normal operation?**

Feed was removed from both reactors and the plant was re-started once the thermal oxidizer was re-lit.

**11) Was the Start-up, Shutdown, Malfunction Plan (SSMP) followed?**

☒ Yes

☐ No\*

\*If not, provide explanation:

**12) If the SSMP was not followed, was IDEM notified?**

N/A

☐ Yes

☐ No

**13) Are revisions to the SSMP needed to better address future bypass incidents?**

☐ Yes

☒ No

If so, provide recommendations:

Name:

*Ben Stewart*

Signature:

*[Signature]*

Date:

*7/14/2010*

## BYPASS INCIDENT REPORT

### Plant 41

This report form applies to the following areas:  
Cyano Reactors and Ammonia Recovery System

Complete this form immediately following any bypass of the Thermal Oxidizer.

#### 1) Bypass Period

Bypass began: Date: 6/27/2010 Time: 20:02

Bypass ended: Date: 6/27/2010 Time: 20:04

Bypass duration: Hours: Minutes: 2

2) Estimated HAPs emissions: Acetonitrile-0.12 lbs., Benzene-0.07 lbs., Xylene-0.00024 lbs.,  
Hydrogen Cyanide-0.11 lbs.

#### 3) What was the general cause of the bypass incident?

Power failure.

#### 4) What type of bypass occurred? (Check all that apply.)

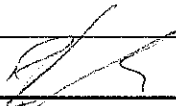
- |  |   |
|--|---|
| <input type="checkbox"/> Instrument nitrogen less than 60 psi      | <input type="checkbox"/> Plant shutdown                       |
| <input type="checkbox"/> Instrument air less than 60 psi           | <input type="checkbox"/> PHD data lost                        |
| <input type="checkbox"/> Stack temperature less than 700°C         | <input type="checkbox"/> Erratic Thermal Oxidizer temperature |
| <input type="checkbox"/> Chamber temperature greater than 1038°C   | <input type="checkbox"/> Operator error                       |
| <input type="checkbox"/> Stack temperature greater than 982°C      | <input type="checkbox"/> Mechanical failure                   |
| <input checked="" type="checkbox"/> Loss of electrical power       | <input type="checkbox"/> Process upset                        |
| <input type="checkbox"/> Other utility disruption [Describe below] | <input type="checkbox"/> Instrument/control parameters        |
| <input type="checkbox"/> Fire eye lost sight of flame              | <input type="checkbox"/> Other [Describe below]               |
| <input type="checkbox"/> Plant start-up                            |   |

#### 5) What plant area or major equipment was affected (be specific)?

Plant 41 thermal oxidizer, reactor A and reactor B.

#### 6) What is the root cause(s) of the bypass incident?

The plant site experienced a brief power outage. This outage caused the fire eye to lose power, resulting in a shut down of the thermal oxidizer.

<b>7) How did you determine the root cause(s) of the bypass incident?</b> Know plant power outage and a review of the alarm screen on the PLC controlling the thermal oxidizer.		
<b>8) What corrective action(s) has been or will be taken to address the root cause(s) of the bypass incident?</b> None. External power failures cannot be controlled.		
<b>9) Who is responsible for completing the corrective action(s)?</b> N/A.		
<b>10) What actions were taken to end the bypass incident and restore normal operation?</b> The power failure cause the AC blower to fail, causing a loss of air to the reactors. Because of this, the operator removed feed from both reactors, ending the bypass event.		
<b>11) Was the Start-up, Shutdown, Malfunction Plan (SSMP) followed?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No* *If not, provide explanation:		
<b>12) If the SSMP was not followed, was IDEM notified?</b> N/A <input type="checkbox"/> Yes <input type="checkbox"/> No		
<b>13) Are revisions to the SSMP needed to better address future bypass incidents?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If so, provide recommendations:		
<b>Name:</b> Ben Stewart	<b>Signature:</b> 	<b>Date:</b> 7/14/2010

## BYPASS INCIDENT REPORT

Plant 41

This report form applies to the following areas:  
Cyano Reactors and Ammonia Recovery System

Complete this form immediately following any bypass of the Thermal Oxidizer.

### 1) Bypass Period

Bypass began: Date: 6/27/2010 Time: 20:05

Bypass ended: Date: 6/27/2010 Time: 20:12

Bypass duration: Hours: Minutes: 7

2) Estimated HAPs emissions: Acetonitrile-0.31 lbs., Benzene-0.18 lbs., Xylene-0.00062 lbs.,  
Hydrogen Cyanide-0.30 lbs.

### 3) What was the general cause of the bypass incident?

Operator error.

### 4) What type of bypass occurred? (Check all that apply.)

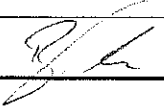
- |  |   |
|--|---|
| <input type="checkbox"/> Instrument nitrogen less than 60 psi      | <input type="checkbox"/> Plant shutdown                       |
| <input type="checkbox"/> Instrument air less than 60 psi           | <input type="checkbox"/> PHD data lost                        |
| <input type="checkbox"/> Stack temperature less than 700°C         | <input type="checkbox"/> Erratic Thermal Oxidizer temperature |
| <input type="checkbox"/> Chamber temperature greater than 1038°C   | <input checked="" type="checkbox"/> Operator error            |
| <input type="checkbox"/> Stack temperature greater than 982°C      | <input type="checkbox"/> Mechanical failure                   |
| <input type="checkbox"/> Loss of electrical power                  | <input type="checkbox"/> Process upset                        |
| <input type="checkbox"/> Other utility disruption [Describe below] | <input type="checkbox"/> Instrument/control parameters        |
| <input type="checkbox"/> Fire eye lost sight of flame              | <input type="checkbox"/> Other [Describe below]               |
| <input type="checkbox"/> Plant start-up                            |   |

### 5) What plant area or major equipment was affected (be specific)?

Plant 41 thermal oxidizer, reactor A and reactor B.

### 6) What is the root cause(s) of the bypass incident?

After a brief power outage, the operator on shift performed rounds to ensure all pumps were running and then proceeded to check on the cooling towers. When he returned to the control room, he immediately re-started the reactors without noticing that the thermal oxidizer was in bypass.

<b>7) How did you determine the root cause(s) of the bypass incident?</b> Process trend analysis and conversation with the operator.		
<b>8) What corrective action(s) has been or will be taken to address the root cause(s) of the bypass incident?</b> A formal review of the incident will be completed by the supervisor and documented. An MOC was approved on 07/01/2010 to add interlocks to the reactor feed valves that will not allow the reactors to be fed during a bypass event. This modification will require a unit shut down to implement.		
<b>9) Who is responsible for completing the corrective action(s)?</b> Plant 41 Operations Coordinator.		
<b>10) What actions were taken to end the bypass incident and restore normal operation?</b> Once the operator realized that the thermal oxidizer was not running, feed was immediately removed from the reactors.		
<b>11) Was the Start-up, Shutdown, Malfunction Plan (SSMP) followed?</b> <span style="float: right;"><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No*</span> *If not, provide explanation:  The operator did not follow the process procedures, introducing feed to the reactors while the thermal oxidizer was shut down.		
<b>12) If the SSMP was not followed, was IDEM notified?</b> <span style="float: right;"><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</span>		
<b>13) Are revisions to the SSMP needed to better address future bypass incidents?</b> <span style="float: right;"><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</span> If so, provide recommendations:		
<b>Name:</b> Ben Stewart	<b>Signature:</b> 	<b>Date:</b> 7/14/2010

